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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME XXVII

1914

WASHINGTON
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The Committee on Publications declares that each paper of this volume was distributed on the date indicated on its initial page. The index, title page, and minutes of meetings for 1914 (pp. i–xiii, 231–234) were issued on February 12, 1915.

Vol. XXVII, pp. ix-xiii

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS.

The Society meets in the Assembly Hall of the Cosmos Club on alternate Saturdays at 8 P. M.

January 10, 1914—519th Meeting.

President Paul Bartsch in the chair and 46 persons present.

William Palmer exhibited the skull of a young opossum found dead with a persimmon seed lodged in its throat; death had been caused by starvation.

Alex Wetmore reported the presence of large numbers of starlings in Washington.

Paul Bartsch reported having recently seen a black vulture near Washington.

The regular program was a continuation of the discussion on Parallel Development. Leonhard Stejneger, Thomas Barbour, Barton W. Evermann, Theodore Gill, Paul Bartsch, A. D. Hopkins and William Palmer took part.

January 24, 1914—520th Meeting.

President Bartsch in the chair and 49 persons present.

The program consisted of three communications, as follows:

"Winter Bird Life in the Swamps of Alabama": E. G. Holt.

"Pollen Protection in the Flowers of *Acacia* and *Anona*": W. E. Safford.

"The Problem of the Gliding Gull": William Palmer.

February 7, 1914—521st Meeting.

President Bartsch in the chair and 36 persons present.

Barton W. Evermann exhibited a model of a peculiar trap, called the Klips, used in capturing fur animals by natives of the Aleutian Islands.

The following communications were presented:

"Notes on the Fossil Mammals of the Fort Union": J. W. Gidley.

"Certain Seeds used for Ornamental Purposes in the West Indies": J. N. Rose.

February 14, 1914—522d Meeting.

Vice-President J. N. Rose in the chair and 32 persons present.

The following communications were presented:

"Seasonal Movements of Fishes at Lake Maxinkuckee": Barton W. Evermann.

"An American Swastika": Henry Talbott.

"Surface Temperature in the Humboldt Current and its Coastal Eddies": R. E. Coker.

March 7, 1914—523d Meeting.

Vice-President A. D. Hopkins in the chair and 26 persons present.

Marcus W. Lyon, Jr., reported an unusual absence of red-headed woodpeckers this winter on the grounds of the Freedman's Hospital.

William Palmer criticised some recent restorations of prehistoric men.

The following formal communications were presented:

"Remains of a Prehistoric Feast": William Palmer.

"Additional Evidence of Mutation in *Œnothera*": H. H. Bartlett.

March 21, 1914—524th Meeting.

President Bartsch in the chair and 47 persons present.

C. V. Piper exhibited curious specimens of cowpeas from Northern Nigeria and of soy beans from Corea.

The regular program consisted of two communications:

"Arabic Interpretations of the Songs of Birds": Paul B. Popenoe.

"Bird Migration in the Mackenzie Valley": Wells W. Cooke.

April 4, 1914—525th Meeting.

Vice-President W. P. Hay in the chair and 35 persons present.

The program consisted of three communications:

"Notes on the Hatching of a Local Terrapin (*Kinosternon pennsylvanicum*)": William Palmer.

"An Account of a Visit to Some of the Smaller Museums": O. P. Hay.

"The Fishes of the Lahonton Basin": J. O. Snyder.

April 11, 1914—526th Meeting.

Vice-President Rose in the chair and 40 persons present.

Three communications were presented:

"Notes on Bermuda Birds": Titus Ulke.

"Reactions of Corals to Food and to Non-nutrient Particles and the Nature of the Food of Corals": T. Wayland Vaughan.

"The Plankton Resources of Some Massachusetts Ponds": A. A. Doolittle.

May 2, 1914—527th Meeting.

Vice-President Hay in the chair and 46 persons present.

W. L. McAtee made remarks on the abundance of birds in the neighborhood of Washington as given in lists of 1862 and 1883, compared with the numbers at present.

Three communications were presented:

"A Journal of the Wilkes Exploring Expedition": W. P. Hay.

"The Home and Country of Linnaeus": S. M. Gronberger.

"Illustrations of Washington Wild Flowers": L. D. Halleck.

October 17, 1914—528th Meeting.

President Bartsch in the chair and 36 persons present.

Resolutions on the death of Dr. Theodore N. Gill were read.

L. O. Howard gave evidence to show that arsenical spraying in connection with the destruction of the gypsy moth in New England had not killed native birds.

President Bartsch reported that English sparrows had eaten many army worms in Washington during the recent invasion of these insects.

Three communications were presented.

"A Mouse that Lives in Tree-tops": Vernon Bailey.

"Botanical Collecting in the Northwest": A. S. Hitchcock.

"The Present State of Fox-farming": Ned Dearborn.

October 31, 1914—529th Meeting.

President Bartsch in the chair and 110 persons present.

Two communications were presented.

"Pelage Variations of American Moles": Hartley H. T. Jackson.

"Twenty Years Experience with Great Apes in Western Africa": R. L. Garner.

November 14, 1914—530th Meeting.

President Bartsch in the chair and 37 persons present.

Marcus W. Lyon, Jr., reported the capture of an American coot on top of the Blue Ridge Mountains.

L. O. Howard exhibited a tooth of a saber-tooth tiger from the asphalt deposits near Los Angeles, Calif.

Three communications were presented.

"Certain Miocene Fossils": William Palmer.

"Arabic Zoology": Paul B. Popenoe.

"A National Bird Census": Wells W. Cooke.

November 28, 1914—531st Meeting.

President Bartsch in the chair and 31 persons present.

C. W. Stiles made remarks on his experiences in sanitation in relation to hook worm disease.

Wm. Palmer exhibited some interesting fossils from the Miocene deposits near Chesapeake Beach.

Three communications were presented.

"A Porcupine Skull Showing an Extra Pair of Upper Incisors": Marcus W. Lyon, Jr.

"Notes on Some Fishes Collected by Doctor Mearns in the Colorado River": J. O. Snyder.

"Notes on Some Birds Observed on the Florida Keys in April, 1914": Paul Bartsch.

December 12, 1914—532d Meeting.

THIRTY-FIFTH ANNUAL MEETING.

President Bartsch in the chair and 18 members present.

The annual reports of officers were received.

The following officers were elected for the year 1915:

President: Paul Bartsch.

Vice-Presidents: W. P. Hay, J. N. Rose, A. D. Hopkins, Mary J. Rathbun.

Recording Secretary: Marcus W. Lyon, Jr.

Corresponding Secretary: W. L. McAtee.

Treasurer: Wells W. Cooke.

Members of Council: William Palmer, Hugh M. Smith, Vernon Bailey, N. Hollister, J. W. Gidley.

President Bartsch was selected to represent the Society as a Vice-President of the Washington Academy of Sciences.

The President reappointed the present standing committees on Communications and on Publications.

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Vol. XXVII, pp. 1-4 February 2, 1914

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DATES FOR OVIS CANADENSIS, OVIS CERVINA, AND OVIS MONTANA.

BY WILFRED H. OSGOOD.

Since the publication of a former paper on "The Name of the Rocky Mountain Sheep,"[*] further data relating to the same subject have been brought to my attention by Dr. Charles W. Richmond. At Doctor Richmond's solicitation, I have arranged this matter for publication and included with it a few additional notes. The previous conclusion that *Ovis canadensis* takes precedence over the two other names published in the same year is not affected except by substantiation.

The facts as they now appear are that *Ovis canadensis* Shaw was published near the first of February, 1804; *Ovis cervina* Desmarest near the first of March, 1804; and *Ovis montana* Schreber near the first of April, 1804.

Ovis canadensis Shaw.

This name was published in the Naturalist's Miscellany, a work of twenty-four volumes issued in monthly parts from August 1, 1789, to July 1, 1813. Each part consists of brief text by George Shaw and a colored plate for each species described. The majority of the plates were executed by Frederick P. Nodder, who seems to have been both publisher and illustrator, but some, as those in Vol. XXIII, were by Richard P. Nodder, while the title page of this volume bears the name E. Nodder. The dates of the parts of the earlier volumes are quite consistently inscribed on the plates showing that the parts were issued regularly on the first of each month in accordance with the plan as announced in the preliminary prospectus.[†] In later volumes dates do not occur with the same regularity, some volumes having no dates whatever, and this fact has been taken as indication that the regularity was not continued[‡] in spite of other evidence which seems conclusive that it was. This evidence need not be detailed, but it includes the original prospectus, the admitted regularity for the first thirteen volumes, the fact that the scattered dates of the later volumes occur on the parts that would in regular course have been issued on those dates,* the fact that such scattered dates occur even in the next to the last volume practically at the end of the series,† and the correspondence of the issue of the last part with the date of Doctor Shaw's death which occurred on July 22, 1813. The last volume, therefore, closes with the part for July instead of that for August as otherwise would have been the case. In the face of this evidence of regularity, the mere absence of printed dates even on a large number of the parts has scarcely any weight. The number of plates per part varied from three to four, but, as first noticed by Doctor Richmond, practically every part begins with a bird and thus it is simple to distinguish parts in the bound volumes when they are not otherwise obvious. Knowing the date of beginning and of ending, the number of parts, and the interval between issues, the determination of the date of any particular part is a matter of very simple mathematics and exceedingly conclusive. By this method, *Ovis canadensis*, which is in an undated part, is shown to have appeared in February, 1804,‡ and the presumption that it appeared February first is so strong as to be accepted for practical purposes.

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[*] These Proceedings, XXVI, pp. 57-62, March, 1913.

[†] See Sherborn, Ann. & Mag. Nat. Hist., (6), XV, p. 376, 1895.

[‡] See Allen, Bull. Am. Mus. Nat. Hist., XXXI, p. 15, March, 1912.

Ovis cervina Desmarest.

This name was first published in the twenty-fourth and last volume of the "Nouveau Dictionnaire d'Histoire Naturelle." This volume and the two preceding ones, issued simultaneously, bear the title page date 1804, while volumes I–XXI are dated 1803, although volumes I–III, as appears below, were actually issued in 1802. The series was issued quarterly in "livraisons" of three volumes each and the exact dates of their publication are indicated by regular notices which appeared in the "Journal Typographique."§ The twenty-fourth volume is noticed in the issue for March 7, 1804, and that therefore is the approximate date of the name *Ovis cervina.*

Since they will doubtless be of use in other connections, the notices of the entire series are given, as follows:

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* In the very few cases where there is not absolute agreement, the date on the plate is always earlier, never later, than the contingent date of issue.

† This evidently escaped Doctor Allen, possibly on account of imperfection in the copy of the work examined by him. In the Field Museum copy and the Library of Congress copy, Plate 1004 of Vol. XXIII is dated 1812. In this connection, it may be stated that these copies directly disagree with Doctor Allen's statements in the following particulars: Vol. II, Pls. 44, 62, 69, and 72 are dated; Volume III, Pl. 78 is dated; Vol. IV, Pl. 124 is dated; Vol. V, Pl. 152 is not dated; Vol. XXIII, Pl. 1004 is dated.

‡ This coincides with Doctor Allen's conclusion that "careful collation of Shaw and Nodder's work given below shows that the actual date of publication of this name was almost unquestionably February, 1804." (l. c., p. 11.)

§ "A weekly journal, published in Paris from 1797 to 1810, devoted exclusively to the announcement of new works, music, etc.; succeeded in 1811 by the 'Journal General de l'Imprimerie et de la Librarie,'" Richmond, The Auk, XVI, p. 326, footnote, October, 1899.

Nouveau Dictionnaire d'Histoire Naturelle.

Livraison 1. Vols. I–III. 29 pll. 1944 pp.
"La premiere livraison est en vente" * * * "la seconde [livr.] paraîtra sans faute dans trois mois, avec 32 planches." Journ. typ., VI, p. 74, 15 Frimaire, an 11 (=Dec. 6, 1802).

Livr. 2. Vols. IV–VI. 32 pll.
"Les autres livraisons se succeront tres rapidement, comme l'a promis l'editeur dans su *Prospectus.*" Journ. typ., VI, p. 137, 15 Pluviose, an 11 (=Feb. 4, 1803).

Livr. 3. Vols. VII–IX. 32 pll.
Journ. typ., VI, p. 210, 24 Germinal, an 11 (=Apr. 14, 1803).

Livr. 4. Vols. X–XII. 27 pll.
Journ. typ., VI, p. 273, 24 Prairial, an 11 (=June 13, 1803).

Livr. 5. Vols. XIII–XV. 32 pll.
Journ. typ., VI, p. 337, 24 Thermidor, an 11 (=Aug. 12, 1803).

Livr. 6. Vols. XVI–XVIII. 32 pll.
Journ. typ., VII, p. 38, 16 Brumaire, an 12 (=Nov. 8, 1803).

Livr. 7. Vols. XIX–XXI. 32 pll.
"Cette entreprise touche a sa fin; sous deux mois paraîtra la derniere Livraison." Journ. typ., VII, p. 82, 30 Frimaire, an 12 (=Dec. 22, 1803).

Livr. 8. Vols. XXII–XXIV. 45 pll.
Journ. typ., VII, p. 165, 16 Ventose, an 12 (=March 7, 1804).

Ovis montana Schreber.

The first publication of this name is that on Plate 294 D of "Die Säugthiere." This plate was supplementary to Heft 62 of the great work and, as shown by Sherborn,* was published in the year 1804. A more exact date is indicated by the following notice under "Neue periodische Schriften" in the Intelligenzblatt der Allgemeine Lituratur-Zeitung, Jahrg. 1804, No. 152, Col. 1229, Sept. 22, 1804:

"In der vergangenem Ostermesse sind von dem Säugethierwerke des Herrn Präsidenten von Schreber folgende Fortsetzungen erchienen:

1) Von der ersten Ausgabe das 62ste Heft, illum. auf holländ. Papier und Schwarz, gr. 4.
2) Von der dritten oder monatlichen Ausgabe das 88ste bis 93ste Heft, illuminirt auf holländisch Papier, gr. 4."

The "Ostermesse," Buchhandlermesse, or Easter bookseller's fair, was held in Leipzig during the week following Easter Sunday. In the year 1804, Easter Sunday fell on the first day of April† and the following day, therefore, may be regarded as the actual date of publication of the name *Ovis montana*, approximately one month after the appearance of *Ovis cervina*, and two months later than that of *Ovis canadensis*.

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* Proc. Zool. Soc. Lond., p. 587, 1891.

† Calculated by the Gauss method for finding the date of Easter.

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Vol. XXVII, pp. 5-8 February 2, 1914

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW HELIANTHUS FROM COLORADO.

BY T. D. A. COCKERELL.

In the vicinity of Boulder, Colorado, the species of perennial sunflowers are common. *Helianthus pumilus* Nutt. abounds in the foothill region, in rather dry, rocky places. *H. subrhomboideus* Rydberg I have found by roadsides east of Boulder, moderately common. The third species is a tall plant common on ditch banks and by streams everywhere on the adjacent plains. Daniels, in his Flora of Boulder, Colorado, and vicinity (1911) calls this third species *H. grosseserratus* Martens, but also cites *H. fascicularis* Greene from Boulder, crediting the record to Rydberg. In his Flora of Colorado (1906) Rydberg gives a single record of *H. grosseserratus* from Fort Collins, but cites *H. fascicularis* from Fort Collins, Boulder, and other localities. According to the characters given in the key (Rydberg, l. c. p. 373), our plant is *fascicularis* and not *grosseserratus*.

The original *H. fascicularis* was described by Greene from Cimarron (Greene) and Gunnison (Baker). It is a plant of the Colorado mountain region, apparently quite distinct from that of the plains. Doctor Rydberg, however, believes that the two represent forms of a single species. I sent him a manuscript description of our Boulder plant and he kindly replied (litt. October 7, 1913): "*Helianthus fascicularis* was described from Colorado, and the type fits your description. It may be that *H. grosseserratus* of Daniels' Flora is the same. I do not remember that *H. grosseserratus* is found in Colorado. It may be that *H. fascicularis* Greene is not exactly the same as *H. utahensis*. I believe that the two represent the extreme forms of the same species, *H. fascicularis* representing the eastern and *utahensis* the western form.'' In a later letter (October 16) Doctor Rydberg further discusses the question, and states that he has a specimen of the Boulder county plant.

In spite of this opinion, it seemed to me that both according to descriptions and herbarium material the plants were not the same, although I was obliged to admit that some of the apparent differences seen on comparing descriptions were fallacious. I accordingly appealed to Mr. Geo. E. Osterhout, who was familiar with both forms in life. He replied (November 6, 1913): ''I had not thought that *Helianthus fascicularis* of the mountains and the *Helianthus* of the river and ditch banks about here (Windsor, Colorado) were the same. Doctor Rydberg in his Flora gives *H. grosseserratus* as occurring at Fort Collins; now I do not think there is any other Helianthus growing about Fort Collins different from the one with which we are familiar.* . . . When Greene and Nelson described the mountain plant I supposed that it was a different species, and it seems to me that they must have thought so, for they must have been more or less familiar with the plant of the plains, which was going for *H. grosseserratus*. The plant along the river here grows in quite large clusters, the peduncles are short, and the stems large and stout. The mountain plant is slender, the peduncles are long, and few stems are found growing together.'' Mr. Osterhout further sends me a sheet of the plains plant, on which he had written long before the present discussion came up, ''*Helianthus grosseserratus* (what I have taken for that) does not have leaves 'hoary-downy beneath,' nor are the scales 'slightly ciliate,' nor does it grow on 'dry plains,' as Gray's Synoptical Flora says.'' After prolonged consideration of the subject, I must agree with Doctor Rydberg that our plant is not *H. grosseserratus*, and with Mr. Osterhout that it is not *H. fascicularis*. It may therefore be separated as follows:

Helianthus coloradensis sp. nov.

Perennial, fully six feet high, growing in clumps, beginning to flower early in August. Stems strict, very smooth, reddish, with a glaucous bloom. Leaves elongate-lanceolate, deep green, rough, with feebly and remotely dentate margins; upper leaves alternate, lower opposite. Involucral bracts very long and slender, about 16 mm. long, long-ciliate basally; disc bracts ordinary, pointed, without lateral lobes or teeth. Achenes perfectly glabrous; pappus-scales nearly two-thirds the length of the disc corollas, two in number, without intermediate squamellae, but the ray achenes are trigonal, and regularly possess three pappus scales; disc yellow; rays bright orange.

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* Rydberg also records *H. fascicularis* from Fort Collins.—T. D. A. C.

Very common at the type locality, few miles east of Boulder, Colorado. Type, No. 1, Cockerell.*

Helianthus coloradensis andrewsi var. nov.

Rays deep orange, a much richer color than the type. Boulder (D. M. Andrews). Type, No. 2, Cockerell.

This is possibly a western subspecies of *H. grosseserratus*, but the leaves are only feebly dentate and beneath are scabrous and hardly pallid. It is not known that the plant meets the range of typical *grosseserratus;* but if it does, and intermediates are found, it will still be a question whether they are not hybrids. The ecological position of the plant is distinct, as well as some of the characters. According to Greene's description of *H. fascicularis*, that species differs by the solitary stems, only two or three feet high; leaves all (so far as the description shows) opposite, the blades 3–6 inches long (9 inches long in *coloradensis*); heads 1 to 3 (many in *coloradensis*); bracts mostly appressed (loose and spreading in *coloradensis*); pappus scales shorter. Comparing *H. coloradensis* with *H. utahensis* (*fascicularis*), as described by Nelson, the same differences appear, and in addition the disc of *utahensis* is said to be yellowish brown, whereas it is yellow in *coloradensis*. Later, Nelson has referred both *fascicularis* and *utahensis* to *H. nuttalli.*† I am indebted to Mr. Osterhout for the loan of a cotype of *H. fascicularis*, from Gunnison, Colorado, 7680 ft., August 16 (Baker, 816). Some of the characters supposed to be distinctive do not hold; the upper leaves are alternate, and the plant carries six heads. The color of the disc does not appear to differ from that of *H. coloradensis*. On the other hand, the stature is very much less than in *coloradensis;* a fully mature plant is 3 feet 6 inches high. The involucral bracts are more or less spreading, at least the outer ones; but they do not extend conspicuously beyond the head in bud as they do in *coloradensis*. This difference is equally evident on comparison with a head of *H. fascicularis* from the Mogollon Mts., Socorro Co., New Mexico (Wooton), kindly sent by Mr. Standley. The leaf blades of the cotype *fascicularis* are about 4 inches long and ¾ inch broad, narrowly acuminate at both ends, with the subbasal lateral nervures coming off at a very acute angle, in entire contrast with the other lateral nervures (style of *Viguiera helianthoides* H. B. K., from Cuba). In *H. coloradensis* the bases of the leaves are much broader, and the subbasal nervures make a large angle with the midrib, differing little herein from the lateral nervures.

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*I have no permanent herbarium, and all my plant types, so far as I have control of them, will go to the U. S. National Museum.

† On the Pacific coast the *nuttallii* group is represented by *H. californicus*, for fresh material of which (grown in the garden of the University of California) I am indebted to Dr. H. M. Hall. This plant is remarkable for having the achenes of the ray florets wholly without pappus scales, even in bud; the disc achenes have the usual pair of long pointed pappus scales. The involucral bracts are sparsely hairy, but not ciliate.

The real *fascicularis* is widely distributed in the mountains, going south into New Mexico, while Mr. Osterhout collected perfectly characteristic specimens in two different years at Bosworth's Ranch, Stove Prairie, Larimer Co., Colorado.

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PROCEEDINGS

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DESCRIPTION OF A NEW SPECIES OF BASILISCUS FROM THE REGION OF THE SIERRA NEVADA DE SANTA MARTA, COLOMBIA.

BY ALEXANDER G. RUTHVEN.

The specimens of *Basiliscus* obtained in the Santa Marta Region by the Bryant Walker Expedition of the University of Michigan differ so markedly from the known forms in the genus as to indicate that they belong to a different species. The Colombian form is apparently nearest to *Basiliscus americanus*, but it is not described under any of the names usually placed in the synonymy of that species. The collection contains thirty-seven specimens.*

Basiliscus barbouri † sp. nov.

Diagnosis.—Size large; general form, including the dorsal and caudal crests, but excepting the head crest, as in *B. americanus*. In adult males the occipital swellings rounded above, meeting in a median groove (thus no parietal ridge), and obtusely pointed posteriorly, quite covering the parietal ridge of bone and its cartilaginous extension and not merging gradually into the crest. The head crest single, not erect but pendent upon the side of the neck, ribbon-like, narrowing rapidly from its base, which extends on the median line of the head from a point above or behind the ear opening to the anterior region of the neck, to form a long narrow lobe. Base of head crest covered with small, pointed, smooth, tubercular, or feebly keeled scales, the upper ones largest; scales of the

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*Since this description was prepared the writer has examined 12 immature specimens in the collection of the Museum of Comparative Zoology, collected by W. W. Brown, Jr., at Palomina (5000 feet) and La Concepcion (3000 feet) in the Santa Marta Mountains. While most of the specimens are too young for specific indentification, the species is indicated by a partly grown male (Cat. No. 6563, M. C. Z.) which has the form of head crest described for *B. barbouri*.

†Named for Mr. Thomas Barbour, Herpetologist in the Museum of Comparative Zoology, Cambridge, Massachusetts.

lobe long and very narrow, six or seven times as long as wide. Ventral scales smooth.

General color above olive brown, usually finely spotted with pale yellowish on the body, five black cross bars on each side between the limbs, and two on the neck, these interrupted by a yellowish band extending from the neck or from above the ear to the groin; limbs dark brown barred and spotted with yellow or pale olive. In the adults there is a short yellow band from the posterior corner of the eye to above the ear, and another, poorly defined below, from the lower eyelid to the shoulder, these light bands usually brighter than the body stripes and with more or less distinct black margins on the temporal region. An indistinct yellowish band sometimes present on the lower part of the sides. Coloration of the young similar to that of the adults except that the markings are more distinct, and the lower body stripe is continuous with the lower neck stripe across the shoulder, anteriorly extending upon the side of the muzzle and involving the lower eyelid. All markings more obscure in adults but as a rule more distinct in the females.

Habitat.—Found on the lowlands at the base of the Santa Marta Mountains, Colombia, from Santa Marta to Fundacion, and in the mountains to 2200 feet (Minca).

Type-specimen.—Museum of Zoology, University of Michigan, Cat. No. 45,411; Gaira River at Minca, San Lorenzo, Santa Marta Mountains, Colombia (altitude 2200 feet); July 14, 1913; Alexander G. Ruthven, collector.

Description of type-specimen.—Adult male. Head crest long and narrow, nearly twice as long as its greatest width, rising on the median line from a point above the ears to the anterior region of the neck; upper margin not erect, when supported it is on the plane of the orbital angles and the highest point is just above the posterior margin of the maxillary protuberances; posterior margin rising directly upward to a point a little behind the highest point of the upper margin and then backward and downward parallel with the dorsal to form the narrow lobe. Entire crest pendent upon the side of the neck from near the base, the latter partially erect to highest point. Occipital swellings rounded above and meeting in a shallow groove, thus covering the parietal extension of the skull so that there is no ridge preceding the crest. Base of crest covered with slightly enlarged pointed scales with low keels that become smooth toward the lobe; scales of lobe in about 8 rows of 16 or 17, long and very narrow, approximately 6 or 7 times as long as broad. Seven upper labials and 7 and 8 lower labials to below the center of the eye; two sublabials in contact with the labials on one side, on the other the second and third partly separated from the labials by a small plate. Ventral scales smooth. A high dorsal crest, as high as the body, and a high caudal crest, both covered with large smooth scales.

Color of body and neck above dull brownish olive, indistinctly and finely spotted with dull yellow and with a few irregular black spots (the remnants of cross bars); the dorsal crest paler and with a few small black spots on the base (also remnants of cross bars). A dull yellow stripe from above the ear to the anal region, well defined on the neck, more obscure but distinguishable on the body; a broad white band from the maxillary protuberances to the fore limb. Tail dark brown basally, this color encroaching broadly and irregularly on the paler crest, distally with alternating bands of pale olive and dark brown. Head brownish olive, this color extending upon the base of the crest; lobe of crest pale olive with broad reticulations of dark brown and a dark brown tip. A pale band from the superciliary region to above the ear, just indicated. Lower eyelid whitish. Lower surface of body and limbs dull white more or less suffused with gray; chin, throat and breast white with blackish bands.

Measurements.—Total length, 697 mm.; head length, 52.3 mm.; head width, 33 mm.; length of head crest,* 58 mm.; greatest height of dorsal crest,† 45 mm.; greatest height of tail crest, 32 mm.; head and body length, 195 mm.; length of fore limb, 78 mm.; length of hind limb, 181 mm.; length of tail, 502 mm.

Notes on paratypes.—In partly grown males the head crest has a form similar to that of the adults, *i. e.*, it is not expanded and erect in the vertical plane, but more or less ribbon-like and dependent on the neck. The form of the crest differs somewhat, however, in the different specimens, in that the posterior margin of the base may be continued backward for a greater or less extent, thus reducing the relative length of the free tip. In a specimen with a body length of 117 mm. the crest is indicated by a broad lobe folded on the occiput. In a specimen with a body length of 138 mm. the lobe is differentiated from the base by longer and wider scales and has a free tip, the whole lying on the dorsal surface of the neck, and this form is maintained in larger specimens, the crest either being carried slightly above the neck or lying flat on one side or the top, and when it reaches some length it is often twisted. A low parietal ridge is present in specimens with a body length of 138 mm. and 144 mm., but in older individuals it is only represented by a short, low prominence, behind the pineal eye.

In a skeleton the neural spines have the following development: Dorsal spines 16, increasing in length from the spine on the last cervical vertebra, the twelfth the longest, the last four rapidly decreasing in size; the second to the sixth expanded (the third, fourth and fifth the most), the others slender, all strongly bent backward from the fourth; the spines of the last two lumbar vertebrae and the two pelvic vertebrae short and about equal in length, the first bent caudad. Caudal spines elongated from the first, 24 in all, the tenth the longest, the last two minute.

Remarks.—As previously stated, the writer can find no original descriptions that apply to this form. In his diagnosis of the species of *Basiliscus*, Cope‡ gives as the characters of *B. goodridgii* (Gray), "one tassle-like head crest with small scales; more than one interorbital row; no longitudinal bands." This description of the head crest (but not the color) would seem to indicate that he had examined specimens of the Colombian form, but if so he was certainly in error in applying Gray's name, for the original description and figure of *Lophosaura goodridgii* were evidently based on a specimen with an expanded and erect crest.

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* Measured from anterior angle on the head.

† Measured along the spines.

‡ Jour. Acad. Nat. Sci., Phila., 1875, p. 125.

Local distribution.—The species is common along the immediate shores of lowland streams at the base of the Santa Marta Mountains, from Santa Marta to Fundacion, and in the mountains to an elevation of 2200 feet (Minca, San Lorenzo). It was not found above Minca, and while it doubtless follows some of the larger streams of the Sierra Nevada to a higher altitude, it quite certainly does not occur on San Lorenzo above 3500 feet.

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PROCEEDINGS

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TEN NEW MARMOTS FROM NORTH AMERICA.

BY ARTHUR H. HOWELL.

A study of the marmots or woodchucks of North America, based chiefly on the collections of the U. S. Department of Agriculture, has revealed a surprisingly large number of unrecognized races, and examination of a large amount of material from practically all parts of the range of the genus has served to show clearly that the three groups represented in North America are practically three species, the forms in each group, with the exception of two isolated species in the *caligata* group, being all subspecifically related to one another. Thus the *flaviventer* group (which includes *engelhardti* and *dacota*) ranges from the Cascades of Oregon and the Sierra Nevada of California to the Black Hills of South Dakota, and consists of a single species divisible into 9 or more races connected by almost perfect series of intergrades.

Since the publication of the results of this study may necessarily be delayed for some time, it is deemed advisable to publish here preliminary descriptions of the new forms.

Marmota monax rufescens subsp. nov.

RUFESCENT WOODCHUCK.

Type from Elk River, Minnesota. Adult male, No. 186,521. U. S. National Museum (Merriam Collection, No. $\frac{2563}{3173}$); April 9, 1886, V. Bailey; original number, 237.

Characters.—Similar to *M. m. monax* (from Maryland and Virginia), but colors much redder, both above and below, the underfur on back pinkish cinnamon instead of light buff; skull similar to that of *monax*, but decidedly smaller and relatively broader across the zygomata; much larger than that of *canadensis*.

Measurements.—Average of five adult males from Minnesota: Total length, 548; tail vertebrae, 143; hind foot, 83. *Skull:* Adult male (type): Condylo-basal length, 87.2; zygomatic breath, 64.7; breadth of rostrum, 18.7.

Remarks.—The range of this form includes the southern parts of Minnesota, Wisconsin, Michigan, and Ontario, and the greater part of New York State. The animal is intermediate in size between *monax* and *canadensis* and differs from both in color and cranial characters.

Marmota monax preblorum* subsp. nov.

NEW ENGLAND WOODCHUCK.

Type from Wilmington, Mass. Adult male, No. 78,360, U. S. National Museum (Biological Survey Collection); April 19, 1896, A. E. Preble; original number, 127.

Characters.—Size medium (smaller than *rufescens*, larger than *canadensis*); colors pale (redder than *monax*, but red not so dark as in *canadensis* or *rufescens*); skull smaller and relatively narrower than that of *rufescens*, especially the rostrum and inter-orbital region.

Measurements.—Adult male (type): Total length, 560; tail vertebrae, 149; hind foot, 80. *Skull* (type): Condylo-basal length, 85.3; zygomatic breadth, 57.4; breadth of rostrum, 18.5.

Remarks.—The woodchuck of southern New England is noticeably smaller and paler than *rufescens*, and larger and paler beneath than *canadensis*. Its skull is much larger than that of *canadensis*. It ranges from Connecticut north to Rutland, Vermont and Ossipee, New Hampshire, and probably farther, but material is lacking from northern New England to determine its exact limits.

Marmota flaviventer parvula subsp. nov.

NEVADA MARMOT.

Type from Jefferson, Nye Co., Nevada (in Toquima Range, about 10 miles north of Belmont). Adult female, No. 93,690, U. S. National Museum (Biological Survey Collection); June 3, 1898, V. Bailey; original number, 6495.

Characters.—Similar to *M. f. avara*, but smaller, and colors darker; similar in color to *flaviventer* from the southern Sierra of California, but colors less reddish and upperparts overlaid with a buffy mantle; similar to *engelhardti*, but smaller, the upperparts more buffy and underfur paler; skull similar to that of *avara*, but decidedly smaller, with rostrum narrowed at the tip; smaller than that of *engelhardti* with narrower and less inflated bullae.

Measurements.—Adult female (type): Total length, 470; tail vertebrae, 130; hind foot, 70. *Skull* (type): Condylo-basal length, 71.3; zygomatic breadth, 49; breadth of rostrum, 17.4.

Remarks.—This is the smallest of the subspecies of *flaviventer* and the smallest known form in the genus. It is known only from the Toyabe and Toquima Ranges but probably occurs, also, in other desert ranges in central Nevada.

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* Named for Messrs. Edward A. and Alfred E. Preble.

Marmota flaviventer nosophora* subsp. nov.

GOLDEN-MANTLED MARMOT.

Type from Willow Creek, 7 miles east of Corvallis, Montana (altitude 4000 feet). Adult female, No. 168,494, U. S. National Museum (Biological Survey Collection); April 8, 1910, A. H. Howell; original number, 1723.

Characters.—Similar to *M. f. dacota*, but slightly smaller; upperparts less extensively reddish and more mixed with black, the underfur decidedly paler; fore part of back overlaid with a mantle of golden buff; skull averaging smaller, with relatively slenderer rostrum and much smaller palatal foramina.

Measurements.—Adult female (type): Total length, 583; tail vertebrae, 170; hind foot, 75. *Skull* (type): Condylo-basal length, 79; zygomatic breadth, 53.2; breadth of rostrum, 17.

Remarks.—This race occupies the northern Rocky Mountain region, from Flathead Lake, Montana, south to the Wahsatch Mountains, Utah, and east to the Bighorn Mountains, Wyoming. It intergrades with *avara* at the northern end of its range, with *dacota* in Wyoming and probably with *engelhardti* and *parvula* in Utah and Nevada, respectively.

Marmota flaviventer luteola subsp. nov.

PARK MARMOT.

Type from Woods P. O., in Medicine Bow Mountains, Wyoming (altitude about 7500 feet). Adult male, No. 186,520, U. S. National Museum (Merriam Collection, No. $\frac{4655}{5306}$); August 13, 1888, V. Bailey; original number, 148.

Characters.—Similar in color to *dacota* and *nosophora*, but paler and less intensely ochraceous above and yellowish instead of deep red below. Compared with *engelhardti:* colors paler and more yellowish (less brownish). Skull similar to that of *nosophora*, but averaging slightly longer and narrower, with longer rostrum and smaller audital bullae.

Measurements.—Sub-adult male (type): Total length, 650; tail vertebrae, 182; hind foot, 90. *Skull* (old male from Mt. Lincoln, Colorado): Condylo-basal length, 92.5; zygomatic breadth, 59.4; breadth of rostrum, 20.8.

Remarks.—This subspecies occupies the mountains of northern Colorado and southeastern Wyoming (from the Laramie Mountains south to Park County, Colorado), intergrading with *dacota* on the north and with *warreni* on the south.

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* In allusion to the fact that the animal aids in the spread of Rocky Mountain spotted fever, through serving as a host for the fever ticks.

Marmota flaviventer warreni* subsp. nov.

WARREN'S MARMOT.

Type from Crested Butte, Colorado. Adult female, No. 202,937, U. S. National Museum (Biological Survey Collection); July 11, 1902, E. R. Warren; original number, 35 (10,639, X catalogue).

Characters.—Size large (equalling *flaviventer* or *dacota*); colors deep red with very little buff (much darker than *luteola*); skull larger than that of *dacota*, with longer, slenderer rostrum and narrower palatal foramina.

Measurements.—Adult female (type): Total length, 565; tail vertebrae, 131; hind foot, 82. *Skull* (type): Condylo-basal length, 89.3; zygomatic breadth, 59; breadth of rostrum, 20.3.

Remarks.—This race is the reddest of the forms of *flaviventer*. It is apparently confined to western Colorado, but the limits of its range are not definitely known. It intergrades with *luteola* on the north and with *obscura* on the south. It differs markedly, both in size and color, from *engelhardti*, but material from eastern Utah will very likely show that these two forms are connected by intergrades. Specimens have been examined from Crested Butte, Mud Spirngs (Garfield Co.), Cochetopa Pass, and Sapinero.

Marmota flaviventer obscura subsp. nov.

DUSKY MARMOT.

Type from Wheeler Peak, 5 miles south of Twining, New Mexico (altitude 11,300 feet). Adult female, No. 133,505, U. S. National Museum (Biological Survey Collection); July 24, 1904, V. Bailey; original number, 8181.

Characters.—Size large (exceeding *dacota* and equalling *flaviventer*); sexes about the same size; tail long; colors dark brown mixed with white, with little of the buff or tawny shades of the related races; face usually without white markings; skull similar to that of *dacota* (that of male about same size, of female larger) with narrower palatal foramina.

Measurements.—Average of 3 adult males from New Mexico: Total length, 655; tail vertebrae, 204; hind foot, 90.7; average of four adult females from same localities: 646; 190; 89.3. *Skull:* Adult female (type): Condylo-basal length, 84.5; zygomatic breadth, 59.4; breadth of rostrum, 22.3.

Remarks.—This is the darkest and one of the largest of the races of *flaviventer*. It occupies the upper slopes of the higher peaks, chiefly above timber line, in northern New Mexico and southern Colorado, from the Pecos River Mountains north to the Sangre de Christo and San Juan Ranges, Colorado. Intergradation with *warreni* is indicated by an intermediate specimen from Florida, Colorado.

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* Named for Mr. Edward R. Warren, whose extensive collection of Colorado marmots has aided materially in clearing up the relationships of the group.

Marmota caligata cascadensis subsp. nov.

CASCADE HOARY MARMOT.

Type from Mt. Rainier, Washington (altitude 6000 feet). Adult female, No. 90,134, U. S. National Museum (Biological Survey Collection); August 11, 1897, W. K. Fisher; original number, 422.

Characters.—Size large (equalling *olympus* and "*sibila*,"* larger than *caligata*); color similar to that of *caligata*, but head and feet usually browner and underparts darker; skull similar to that of *sibila*, but relatively broader across zygomata and inter-orbital region; decidedly larger than that of either *caligata* or *okanagana*.†

Measurements.—Adult female (type): Total length, 740; tail vertebrae, 230; hind foot, 107. *Skull:* Adult male from Cascade River (near head), Washington: Condylo-basal length, 106.2; zygomatic breadth, 69.8; breadth of rostrum, 24.5.

Remarks.—The Cascade Marmot differs from the Olympic Marmot in being much whiter, and in skull characters; from *okanagana* of the Selkirk and Gold Ranges and *sibila* of northern British Columbia in whiter and browner (less black) coloration above; and from *caligata* in much larger size. It ranges from Mount Rainier, Washington, north to the Mount Baker Range, British Columbia.

Marmota caligata nivaria subsp. nov.

MONTANA HOARY MARMOT.

Type from mountains near Upper St. Mary's Lake, Montana (altitude about 6100 feet). Adult female, No. 72,235, U. S. National Museum (Biological Survey Collection); May 27, 1895, A. H. Howell; original number, 23.

Characters.—Similar in size and skull characters to *sibila*, but colors much whiter, both above and below; skull closely similar to that of *sibila*, possibly averaging a little shorter; compared with *cascadensis* the premaxillæ are broader.

Measurements.—Average of 4 adult females from type locality: Total length, 751; tail vertebrae, 224; hind foot, 105. *Skull:* Average of 4 adult females from same locality: Condylo-basal length, 102; zygomatic breadth, 65.7; breadth of rostrum, 23.

Remarks.—This form, although closely resembling *sibila* in skull characters, differs widely from it in color, being, indeed, the whitest member of the group. In addition to the series from the type locality, specimens have been examined from the Bitterroot and Salmon River Mountains, Idaho.

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* *Marmota sibila* Hollister, Smiths. Misc. Coll., vol. 56, No. 35, 1912, p. 1; type locality, Moose Pass, Alberta (not *Arctomys sibila* Wolf).

† *Arctomys okanaganus* King, Narr. Journ. to Shores of the Arctic Ocean, II, 1836, p. 236; type locality: The region occupied by the Okanagan Indians, "on the borders of the Rocky Mountains * * * between the Columbia and Fraser Rivers"—hereby fixed in the Gold Range, British Columbia.

Marmota caligata sheldoni[*] subsp. nov.

MONTAGUE ISLAND MARMOT.

Type from Montague Island, Alaska. Adult male, No. 137,319, U. S. National Museum (Biological Survey Collection); May 24, 1905, Charles Sheldon; original number, 12. (5461, X catalogue.)

Characters.—Similar to *caligata*, but size smaller; skull with shorter nasals and narrower premaxillæ.

Measurements.—Adult male topotype: Total length, 670; tail vertebrae, 185; hind foot, 94; adult female topotype: 640; 180; 90. *Skull.*—Adult male (type): Condylo-basal length, 89.5; zygomatic breadth, 61.5; breadth of rostrum, 20.5.

Remarks.—This race is confined to Montague Island and differs from the mainland form in size only.

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[*] Named for Mr. Charles Sheldon, in recognition of his valuable contributions to our knowledge of Alaska mammals.

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PROCEEDINGS

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NEW MOLES OF THE GENUS SCALOPUS.

BY HARTLEY H. T. JACKSON.

While engaged in a monographic revision of North American Talpidæ, based mainly upon the Biological Survey Collection, the writer has found several undescribed species and subspecies of *Scalopus*. Since the final paper on the group will not be published for some time, the following diagnoses are issued now:

Scalopus aquaticus howelli subsp. nov.*

Type, adult ♂, skin and skull, No. 177,931, U. S. National Museum, Biological Survey Collection, from Autaugaville, Alabama; collected January 4, 1912, by L. S. Golsan.

General characters.—Intermediate in size between *Scalopus a. aquaticus* and *S. a. australis*, usually paler than either; skull flat, less angular than that of *aquaticus;* rostrum long and narrow.

Color.—Type, in full winter pelage: back dark drab becoming buffy brown on nape and head, nose and wrists slightly tinged with ochraceous tawny; beneath similar to back but much tinged with tawny-olive.

Measurements.—Type, measured in the flesh: total length, 152; tail vertebræ, 20; hind foot, 18. Skull of type: condylobasal length, 32.0; greatest length, 32.7; palatilar length, 13.1; breadth across mastoids, 17.1; interorbital constriction, 7.4; maxillary tooth row, 10.2; mandibular molar-premolar row, 10.1.

Remarks.—Scalopus a. howelli is in many respects an intermediate form between *aquaticus* and *australis;* it differs from each in cranial characters. Its geographic range extends from eastern North Carolina and South Carolina west across northern Georgia, central Alabama and southern Mississippi.

Scalopus aquaticus machrinoides subsp. nov.

Type, adult ♂, skin and skull, No. 169,717, U. S. National Museum, Biological Survey Collection, from Manhattan, Kansas; collected June 1, 1910, by W. E. Berg.

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* Named for Arthur H. Howell, who has contributed much towards our knowledge of the mammals of the southern United States.

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General characters.—Exceeded in size only by *Scalopus a. machrinus*, from which it differs also in its more grayish coloration with a greater tendency in full pelage towards a silvery sheen.

Color.—In late winter pelage: upper parts ranging from bister to clove brown, becoming paler on face and wrists; underparts slightly paler than back, and usually showing more slate-color of base of hairs, washed ventrally with raw umber or mummy brown.

Measurements.—Skull of type: condylobasal length, 37.1; greatest length, 37.7; palatilar length, 15.5; breadth across mastoids, 19.4; interorbital constriction, 8.0; maxillary tooth row, 12.1; mandibular molar-premolar row, 12.0.

Remarks.—This is the mole of the humid region west of the Mississippi River and north of southern Missouri; it is found as far west as eastern Kansas, and the mouth of the Sioux River, South Dakota. Its affinities, as have been intimated, are with *machrinus*, from which it can be easily separated by its smaller size and shorter skull.

Scalopus aquaticus pulcher subsp. nov.

Type, adult ♂, skin and skull, No. 170,698, U. S. National Museum, Biological Survey Collection, from Delight, Arkansas; collected January 20, 1911, by W. G. Savage.

General characters.—Size about that of *Scalopus a. aquaticus*, hind foot larger; skull larger than that of *aquaticus*, flatter, less swollen supraorbitally, wider interorbitally; supraoccipital wider than in *aquaticus;* skull narrower through mastoids than that of *machrinoides*, with narrower rostrum and smaller teeth. Slightly larger than *aereus;* skull relatively wider interorbitally, through mastoids and through rostrum, flatter and more angular than that of *aereus*.

Color.—Full winter pelage: back dark fuscous with many hairs tipped with pearl gray, giving in places a slightly frosted appearance; top of head mummy brown; nose cinnamon-brown; underparts sepia, showing much blackish plumbeous of base of hairs.

Measurements.—Type, measured in the flesh: total length, 164; tail vertebræ, 25; hind foot, 22. Skull of type: condylobasal length, 35.0; greatest length, 35.8; palatilar length, 14.6; breadth across mastoids, 17.8; interorbital constriction, 7.7; maxillary tooth row, 11.1; mandibular molar-premolar row, 10.8.

Remarks.—This mole is confined to the humid region of southwestern Arkansas, eastern Texas and western Louisiana, where it appears to be locally common.

Scalopus aquaticus caryi subsp. nov.*

Type, young adult ♂, skin and skull, No. 116,799, U. S. National Museum, Biological Survey Collection, from Neligh, Nebraska; collected September 18, 1901, by Merritt Cary. Original number 307.

General characters.—Palest known member of the genus *Scalopus;* in general characters most nearly like *Scalopus a. intermedius*, but much paler and lacking ochraceous suffusion on nose and wrists; slightly smaller than *intermedius*, with skull actually shorter and relatively broader through mastoids.

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* Named for Merritt Cary, formerly of the U. S. Biological survey.

Color.—In autumn pelage: back light drab slightly tending towards avellaneous, becoming lighter on head and shading in some cases into ivory yellow on nose; underparts much the same color as back, more mixed with neutral gray and occasionally washed with Saccardo's umber or cinnamon-brown.

Measurements.—Type, measured in the flesh: total length, 160; tail vertebræ, 31.5; hind foot, 22. Skull of type: condylobasal length, 33.9; greatest length, 34.6; palatilar length, 14.2; breadth across mastoids, 17.9; interorbital constriction, 8.2; maxillary tooth row, 11.1; mandibular molar-premolar row, 10.9.

Remarks.—This form can be readily distinguished from all other moles with which it is likely to be confused by its pale color and lack of ochraceous suffusions. It appears to be the mole of the northern plains region from Kansas north to northern Nebraska, and from central Nebraska west to eastern Colorado.

Scalopus inflatus sp. nov.

Type, young adult, sex unknown, skin and skull, No. 52,709, U. S. National Museum, Biological Survey Collection, from State of Tamaulipas, Mexico (45 miles from Brownsville, Texas); collected in 1892 by Frank B. Armstrong.

General characters.—Larger than *Scalopus a. texanus*, color less ochraceous; skull high and arched, with prelachrymal region much swollen; rostrum broad; audital bullae high and well defined; zygomata heavy; posterior edge of lachrymal foramen meets zygomatum at nearly right angle; mandible heavy; outer groove in third upper premolar pronounced; first lower premolar small and inconspicuous.

Color.—Back between wood brown and drab, becoming ochraceous-buff on cheeks; underparts general tone of color much as on back but more mixed with mouse gray.

Measurements.—Skull of type: palatilar length, 13.4; breadth across mastoids, 17.0; interorbital constriction, 7.1; maxillary tooth row, 11.1; mandibular molar-premolar row, 11.0.

Remarks.—The description of this remarkable new mole is based upon a single specimen in the Biological Survey Collection, which has remained for several years with the skull inside the skin. When the skull was removed it showed many characters warranting its recognition as a distinct species. Unfortunately the specimen is imperfect; it lacks complete data, the pelage is rather ragged and perhaps faded; the skull has the posterior section of the braincase back of the parietals and basioccipital broken away.

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PROCEEDINGS

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NEW SPECIES OF OPUNTIA.

BY DAVID GRIFFITHS.

This 6th installment* of critical studies in the genus *Opuntia* contains descriptions of new species studied in their natural habitat and under cultivation. The types, now in most cases at field stations in Texas and California, will in the future be deposited in the United States Department of Agriculture.

Opuntia magna sp. nov.

A tall open branched, large shrub, or small tree, 2 or 3 m. or more high, and quite symmetrically arborescent, having a distinct cylindrical axis which is undivided, and branching perfectly or imperfectly whorled at the apex of previous season's growth, the trunks 10 cm. or more in diameter, strongly tubercular for 5 or 6 years, after that more or less smooth and dirty gray-brown; joints cylindrical, 30 cm. or more long and 4 cm. in diameter, very strongly tubercular, the tubercles being 15 mm. high and 4 to 4½ cm. long, upper and lower curvatures uniform, the whole surrounded by a depressed darkened line separating contiguous tubercles; areoles situated on upper slope of tubercles, white, lenticular, prominently glandular, turning dirty-gray-black in age, 8 mm. long, becoming obovate by formation of new white, glandular areolar tissue above; leaves 2 to 3 cm. long, terete, subulate, cuspidate, backward curved, tinged with red at tip, 2½ mm. in diameter at base; spicules yellow in a small scarcely protruding tuft in upper angle of areole, not visible in age; spines reddish-brown with prominent rather gray sheathes on current season's growth, 9 to 15, the lower sloping down and 15 mm. long, the 2 lateral just above also sloping down and 10 to 12 mm. long, the others shorter and more erect, spreading, not increasing much in length in age, but increasing in numbers to 30 or 40 on old trunks; flowers purple; fruit strictly annual, strongly tubercular, subglobose to hemispherical, deeply cupped at apex, 30 to 35 mm. in diameter, bearing white areoles without visible glands, bearing a triangular tuft of yellow spicules, 1 mm. long and 1 to 3 long, delicate reddish-brown fugacious spines, 1 to 2 mm. in length and sheathed at their tips only, and 2 to 3 delicate, fugacious, shorter, lighter colored unsheathed bristles beside; seeds white, typical of the group, and 3 mm. in diameter.

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* Annual Reports Mo. Bot. Gard. **19–22**: 1908–1912, and M. f. K. **23**: 1913.

This species belongs to the *Op. arborescens* group. The type is preserved under my inventory No. 8152, which was grown from cuttings secured near Torreon, Mexico, September 24, 1905.

Opuntia spinotecta sp. nov.

An arborescent, divaricately branched, cylindrical jointed species, 2½ m. high, with trunks 10 to 12 cm. in diameter, commonly compactly, but in age openly branched, and having thick fusiform, tuberous roots; joints variable, but mostly 10 to 15 cm. long, but often 40 cm. in length, somewhat clavate, the tubercles 1 cm. high, with upper crest half the length of the lower and a darker green line surrounding the entire tubercle; areoles occupying upper crest of tubercles, broadly obovate, 3 to 4 mm. long, tawny, turning to dirty gray or black, but with new tawny wool appearing in upper part of areole for two years or more; leaves cylindrical, subulate, cuspidate, 1 cm. long; spicules white, not conspicuous on either joint or fruit; spines 3 to 6, mostly 4, the upper central the longest, about 3 cm. long and loosely sheathed, the lower lateral ones losing their sheathes early, flesh-colored or brown, with white papery sheathes; flowers purple; fruit obovate to subglobose, yellowish-green, persistent.

The type bears my inventory No. 9859, collected at Durango, Mexico, September, 1909. The description was drawn mainly in the type locality. The plant has been in cultivation since the date of collection.

Opuntia valida sp. nov.

An erect to ascending, widely radiating branched species, with main limbs ascending or horizontal, and sometimes resting on edge under cultivation, but mostly erect to ascending in natural habitat, 1 m. in height and 2 m. in spread of branch; joints obovate, large, thick, glaucous, slightly blue-green, very broadly pointed or rounded above, commonly 25 by 32 cm. or again 25 by 27 cm., 1 joint on plants in cultivation, 30 by 42 cm. which is unusual; areoles very large, ovate, 8 mm. long on sides of joints and on edges subcircular, 9 to 11 mm. in diameter, at first brown, turning almost black, finally gray, the wool prominent, mostly elevated 1 or 2 mm. above surface of joint especially on the edges, spicules scattered, not numerous, from 2 mm. long on sides to 1 cm. long on edges of joints, commonly only about 25, increasing in age, but always scattered through entire areole, although at first appearing on its upper half, stout and faintly annular; spines bright deep reddish-brown at base, fading gradually to a semi-translucent bone-like tip, and in age becoming gray, flattened on upper side, faintly annular, sometimes slightly twisted, diverging in all directions, 2 to 5 strongly diverging centrals, 2 to 6 cm. long and 2 to 5 weaker, very much shorter, recurved ones below; flowers yellow; fruit reddish-purple.

The type is preserved under my collection No. 9194, prepared from cultivated specimens at San Antonio, Texas, which were grown from cuttings secured in the vicinity of San Antonio, New Mexico, in 1908.

Opuntia brachyclada sp. nov.

A low, caespitose species, seldom attaining a height of over 12 to 15 cm., in nature only about 10 cm., but often forming dense masses 50 or more cm. in diameter; joints exceedingly variable, slightly to decidedly flattened or at times almost perfectly terete, narrowly obovate to cylindrical, 2½ by 10 cm. or often 26 by 130 mm. or even as low as 12 by 30 mm., sometimes one on top of the other and 2 or 3 joints high, but usually new joints appear a little below on outside of outer joints of the clump, glaucous, bluish-green, young joints reddish tinged; leaves small, conical, cuspidate, greenish red, about 2 mm. long; areoles subcircular, 3 mm. in diameter, and 10 to 16 mm. apart, spicules light-brown, changing to a dirty brown, at first surrounded by a narrow gray zone of wool, which is later obliterated, the tuft, therefore, occupying the entire areole except the very narrow wool zone, commonly 2 mm. in length, and numerous; spines absent; flowers purple; fruit small, subglobose, 1 to 1½ cm. in diameter, yellow or with a blush of red on one side.

The spicules are as described above in the type specimen, but they may range in color from dirty-yellow to deep brownish-red as is true of the entire group. The type is preserved under my collection No. 10,768, and occurs commonly in the mountain valleys above San Bernardino, California.

Opuntia chaetocarpa sp. nov.

A tall, arborescent, open branched species, 2 to 3 m. high, and having a spread of branch about the same dimensions, with us now about 1 m. high and fruiting sparingly after, being set from cuttings June 1, 1912; joints obovate, glossy-dark-green, smooth to the touch, raised, tubercular at areoles the first season, but nearly smooth after that, measuring 14 by 27 cm. for early spring joints, which are fruiting now; areoles small, oval to ovate or obovate, becoming subcircular in age, at first 2 to 3 mm. long, later 2 to 3 mm. in diameter, brown; leaves circular in sections, subulate, cuspidate, mostly slightly recurved, 3 to 4 mm. long, spicules at first scarcely visible, but at 1 year of age form a compact tuft, 3 to 6 mm. long in upper part of areole, and increasing still further in age; spines white, at first single, erect, and about 2 cm. long, at 1 year of age, 2 or 3 divergent or erect, and 1 often 5 cm. long and others shorter, flattened, twisted; flowers greenish with tinge of red in bud, light yellow when opened, filaments greenish, style white with a scarcely noticeable tinge of red, stigma white, 6-parted; ovary obovate with deep conical pit at apex, prominent tubercles and 1 to 2 spines in each upper areole; fruit red, pyriform, edible, but of small size.

The description was drawn in July, 1913, from specimens grown under cultivation, the descriptions made in the field having been lost. The type bears my collection No. 9747, and was collected in the region of Oaxaca, Mexico, in August, 1909.

Opuntia sanguinocula sp. nov.

A low, hemispherical, or usually more flattened shrub, 25 to 40 cm. high, and spreading 1 meter or more, main arms resting on ground on edge or ascending and secondary ones erect from them; joints broadly to narrowly obovate and sometimes nearly subcircular, some of last year's 9 by 25 cm., others 8 by 10 cm., mature growth of this year 6 by 8 to 8 by 12 cm., slightly glaucous, gray-green, slightly raised at areoles for a couple of years; areoles obovate, brown, 2 mm. long, enlarging to subcircular, and 3 to 4 mm. in diameter in age; leaves comparatively large, 12 mm. in length, subulate, cuspidate; spicules brown, turning dirty yellow, in a compact tuft in center of areole, completely surrounded by a zone of wool, 2 mm. long, in age filling the areole entirely and becoming 3 to 4 mm. in length; spines white, 1 to 3, mostly 1 or 2, confined to upper and marginal areoles of the joint, erect, diverging or in age, the second especially sloping down, 15 to 25 mm. long, slightly flattened, twisted, with bone-like tips; flowers lemon yellow with bright deep red glossy centers, filaments yellow distally and greenish, proximally, stigma white, 6-parted, 6 to 7 cm. in diameter when fully opened; fruit light pinkish red, and at this place often persisting to second year and bleaching again to greenish yellow, always greenish within.

The type is preserved under my inventory No. 9359, and was grown from plants secured near Taylor, Texas, in July, 1908. The description was drawn from cultivated plants at Chico, California, July, 1913.

Opuntia riparia sp. nov.

An erect, hemispherical, open branched shrub, 150 to 175 cm. high, and having a spread of 2 or more m.; joints long, obovate, sharply to broadly rounded above, glaucous, about 15 by 23 cm.; areoles large, obovate on sides but subcircular on edges of joints and often 8 mm. in diameter, brown, not raised; spicules 1 cm. long, in a spreading unequal tuft on edges and shorter on sides of joints, light brown; spines white, often but not always colored at very base, 2 to 3 cm. long, very stout, flattened, twisted, 2 to 3 on sides and 3 to 6 on edges of joints, the upper central erect, the others spreading or sloping downward; flowers yellow, deeper yellow within, filaments orange, style white, stigma very large, deep green, 10 to 11 parted, 10 cm. in diameter when fully opened; fruit red with purplish tinge.

Frequent along upper foothills' courses of dry washes in the Santa Rita Mountains, Arizona. Collected April, 1908, and grown in cultivation since that date.

Opuntia rugosa sp. nov.

A low, ascending, radiating, yellow-green species, 60 cm. or more high, with main branches resting on edge and radiating, and others erect from them, often having a spread of 150 cm. or more; joints obovate, broadly rounded above, about 11 by 14 cm., or again 14 by 23 cm., sharply rounded above, tubercular raised at areoles the first season, later becoming nearly smooth, but a little raised at 2 and 3 years; areoles obovate, tawny-brown the first year, 5 by 3½ mm., later becoming subcircular, and 5 mm. in diameter, dirty gray, varying 2 to 4 cm. apart; leaves large, subulate, cuspidate, dull-light-reddish tipped, 1 cm. long; spicules conspicuous, formidable, in a compact, unequal, triangular, or crescentic area above, with a few scattering through remainder of areole, yellow; spines white, only accasionally slightly tinted at base, erect, diverging in all directions, at first 2 or 3 increasing to 4 or 6, 2 or 3 of which are central, long, large, flattened, twisted, sometimes becoming 6 cm. long, others 2 to 3 cm. long, and somewhat recurved; flowers opening at noon, canary yellow, 7 to 8 cm. in diameter when fully opened, yellowish-green with a tinge of dull red in bud, petals obovate, cuneate, broadly rounded above, the outer row obtuse, wavy, or almost crenate, slightly eroded, slightly greenish within, filaments yellow, greenish at base, style white, stigma deep dark-green, 8-parted; ovary clavate, 3 by 6 cm., tubercular, raised at the light-brown areoles, which are nearly filled with yellow spicules, and long fugaceous spines, 1 cm. in length; fruit pyriform, reddish purple.

The type is preserved under my inventory No. 10,364, and was secured originally near Pomona, California.

Opuntia affinis sp. nov.

A low, arborescent species, from 125 cm. high with us at 4 years of age to 2 m. or more in its natural habitat; joints obovate, 13 by 35 cm., broadly rounded above and gradually narrowed below, densely silky, villous to the touch, and villous nature plainly visible when viewed in proper light, slightly raised at areoles, the tubercles being surrounded by a sunken dark-green line; leaves small, subulate, pointed, scarcely 2 mm. in length; areole small, obovate, 3 mm. long, 25 to 30 mm. apart, white to gray; spicules light straw-colored, at first not conspicuous but rather in a connivent tuft, 3 mm. long; spines absent below and 1 to 5 in upper ⅚ of joint, straw-colored, becoming white the second year, the longest 3 cm. and others much shorter, increasing in age in both length and numbers, at 3 years often 10 in number and some 6 cm. long, divergent, flattened, angular, twisted; flowers dull dark-red in bud, with stigma protruding the day before the petals spread, small, about 3 cm. in diameter when opened, petals 20 to 25 mm. long, slightly, when at all, recurved, ribs of petals red and wings orange, filaments greenish below and pink above, style bright-glossy red, stigma dull-greenish-red, 4-parted, equaling the petals in length; ovary small, subglobose, deeply pitted, 15 to 17 mm. in diameter, with small subcircular to slightly transversely elongated, dirty, brown areoles, 4 mm. apart; fruit small, subglobose, red.

In some respects the species stands midway between the genera *Nopalea* and *Opuntia.* Occasionally the pistil is actually longer than the petals. The type is preserved under my inventory No. 9751, and was collected in the State of Oaxaca, Mexico.

Opuntia confusa sp. nov.

"Still later, while the page proof of this paper was in hand, Dr. Griffiths's publication of *O. arizonica* was received, which proved to be an anticipation of another of my species. I accordingly here substitute Dr. Griffiths's name, allowing, however, my description to stand as already in type."—Contr. U. S. Nat. Herb., *12:* 402. 1909.

The facts appear to be as follows:

(1) *Opuntia arizonica* Griffiths is from the highlands of northern Arizona, and has never been collected in the southern part of the State.

(2) The plant referred to by Doctor Rose grows near Tucson, and so far as known, does not occur on the San Francisco Highland.

(3) There is little in common between the two species except the mere arrangement of the spines.

(4) It is an error to refer this Tumamoc Hill species to *Opuntia arizonica.*

(5) To this Tumamoc Hill species, I apply the above name, the type of which is my inventory No. 10,441, and refer to the description associated with the above reference. Several emendations, however, are necessary. The flowers are only 5 to 8 cm. in diameter. The spicules are not "caducous except on margins of joints." It is true that they are all easily separable, but more so on the edges than on the sides of the joints. The fact is that the spicules on the edges and sides of joints are radically different. In the latter situation, they are short and more closely aggregated, whiie in the former they measure a centimeter in length, are more scattered through the areole, and more easily separable. This is a characteristic of a very large group of southwestern species, if indeed it may not be said to be common enough in the flat-jointed species to be considered a group characteristic. The fruit is short-pyriform to subglobose, red, with abundant bloom which is largely lost at complete maturity, when the color becomes dark dull red. The color of the spines can not be called "bright red," but dark-red to reddish-brown.

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SOME UNDESCRIBED NORTH AMERICAN SAPROMYZIDÆ.

BY J. R. MALLOCH.

In working over the material belonging to the Sapromyzidæ contained in the collection of the Illinois State Laboratory of Natural History I found a few species that are evidently undescribed, and herewith present descriptions of these forms, along with descriptions of those to which they are most closely allied.

It is very probable that some of the species now described are represented in other collections, as the characters for their differentiation are very readily overlooked, and they may readily find a place along with examples of the old species unless carefully examined.

In the case of *Lonchaea vibrissata* there is met with an instance of an apparently aberrant form which, provided one considered the bristle as a vibrissa, can not be placed in its proper family by the synoptic keys in use for this group. I am not, however, prepared to consider the strong bristle as the vibrissa, as it does not occupy the same position on the vibrissal angle as in the case of those species possessing true vibrissae. This species is in other respects a true *Lonchaea* and may conveniently be retained within the limits of that genus.

I have to thank Dr. S. A. Forbes for permission to publish this paper, and Mr. W. L. McAtee of the Bureau of Biological Survey for the opportunity of comparing his material with that in the collection of the Illinois State Laboratory of Natural History. Unless otherwise stated types are in the latter collection.

Sapromyza similata sp. nov. and **S. compedita** Loew.

S. similata may be characterized as follows:

Male.—Yellow subopaque; only the second joint of hind tarsus and apices of the last three hind tarsal joints black. Wings with cross veins distinctly and broadly infuscated, a fuscous spot at end of marginal cell, which is generally connected with a spot below it on the third vein, and another spot of same color at apex at third vein, the spot on middle of last section of third vein is always separated from the spot enclosing the outer cross vein and distinctly nearer to the wing tip.

The arista is very indistinctly pubescent; the mesonotum has 4 dorsocentral bristles, the anterior one very weak, and situated just in front of suture; the forwardly-directed ventral appendages of the hypopygium have a very distinct rounded incision at about their middle which, when they lie together, presents a large rounded opening, and the hairs at apices of these organs are of irregular lengths, one of them being especially long; the hind tarsus is elongated, the basal joint slender, the second joint flattened, but distinctly longer than broad, the apices of the next three joints distinctly over half as broad as the apex of the second (Fig. 4); hind tibia slightly thickened and without any noticeable ventral hairing; last section of fourth vein distinctly longer than the penultimate section (Fig. 2).

Female.—Similar to the male in color and chaetotaxy. The hind tarsus has the second joint very little thickened. (Figs. 2, 4, and 17 illustrate *similata.*)

In *Sapromyza compedita* Loew the male is similar in color and in the number of wing marks to the above, but the spots in marginal and submarginal cells are more distinctly coalescent and are almost invariably connected with the cloud on the posterior transverse vein.

The arista is distinctly haired; the mesonotum has normally only three pairs of dorsal-centrals, the anterior weak pair of *similata* being absent; the ventral organs of hypopygium have a much smaller internal excision, causing the opening, when they lie together, to be very small in comparison with that in the previous species, and the apical hairs on those organs are less conspicuously irregular than in that species; the second joint of the hind tarsus is very much flattened, almost disc-like, and as broad as long, the apices of the remaining joints of hind tarsus are not nearly half as broad as apex of second (Fig. 5); hind tibia with several loose, soft hairs on the apical fourth of the ventral surface; last section of fourth vein equal to, or slightly shorter than, penultimate section. (Fig. 6.)

Female.—Similar to male in color and chaetotaxy. The hind tibia is devoid of the ventral hairs, and the second joint of the hind tarsus is barely broader than the next joint. (Figs. 5 and 6 illustrate *compedita* Loew.) These species are very close to each other, but may be readily separated by the characters given in the above summary.

I have before me nine specimens of *similata* from Algonquin, Illinois (Nason); one female (the type), St. Joseph, Illinois; one female, Quincy, Illinois, swept on sand bar, August 12, 1889 (C. A. Hart); one male, Michigan; one female, Merchantville, New Jersey; one female, swept from weeds, Normal, Illinois, June 3, 1884; and one female, Pond Grove, Urbana, Illinois, June 13, 1889 (C. A. Hart). Type in Illinois State Laboratory of Natural History. Fourteen paratypes in collection of W. L. McAtee from the following localities: Washington, D. C., May, June, and July; Plummers Island, Maryland, July 21, and Asheville, North Carolina, June 26.

S. compedita is represented in the same collections by four specimens, three females and one male, from Illinois, and one specimen from Great Falls, Virginia, June 30, and another from Maryland, near Plummers Island, June 6.

Sapromyza bispina Loew, *et al.*

In the genus *Sapromyza*, as in most other genera, there are several species which are very inconspicuously marked, do not lend themselves readily to classification, and the characters for the differentiation of which are very minute or obscure. The earlier workers generally refrained from dealing with such species, or if they did notice them, it was either to associate them with previously described forms of similar general appearance, or else to describe them in such a vague manner that it is almost impossible to decide just what species was before them unless by examination of the type. It is to such an obscure section of *Sapromyza* that *bispina* Lw. belongs, and when engaged in identifying the material in the collection of the Illinois State Laboratory of Natural History, I have had to separate the species belonging to this group from *bispina* Lw., and *tenuispina* Lw. In the belief that it may prove useful to workers on this genus I herewith present, with the description of some new species, a comparative table for their separation. The species included all have the wings unmarked, the cross veins alone being occasionally slightly blackened, though the membrane of the wing adjoining these veins is never infuscated. The face, mesonotum, pleurae, scutellum, abdomen, and legs are also without black marks, in the form either of spots, bands, or stripes. In making an examination of the wing for markings it is better to use a low power hand lens, as then there is no chance of mistaking the blacker cross vein for the spot-like infuscation which is present *Sapromyza* (*Minettia*) *nubila* Melander.

1. Mesonotum in both sexes grayish on disc; cheeks without any hairs, 4 very strong dorso-centrals present; 2 rows of strong acrostichals; arista short-haired; abdomen in both sexes shorter than thorax; in the ♂ distinctly tapering toward the apex, keel-shaped, its height as great as its breadth at base on dorsum, in ♀ broad to end of 6th segment, the 7th abruptly contracted, projecting cone-like, from the 6th; legs stout; mid tibia with 3–4 well developed apical spurs; hind femur in ♂ with 3–4 in ♀ with two bristles at apical third on antero-ventral surface; hind tibia normal . . . . *harti*, new species.

Mesonotum yellow in both sexes, very rarely with a slightly grayish or brownish tinge in ♀; cheek generally with microscopic hairs on margin; abdomen not, or slightly tapering, never keel-shaped in ♂; in ♀ the abdomen tapers gradually to apex of the 7th segment, not suddenly constricted; legs normal 2

2. Hind tibia of ♂ with distinct, moderately long, soft hairs, on at least the basal third of the antero-ventral surface 3

Hind tibia without such hairs 5

3. Hind tibia ciliated on almost its entire length; prolongation of last ventral abdominal segment short . . . *cilifera*, new species.

Ciliation of hind tibia confined to basal half 4

4. Last dorsal abdominal segment with numerous, black setulae, which form a noticeable group on lateral margin at apex; process on last ventral segment short . . . . . *seticauda*, new species.

Last dorsal segment without the conspicuous group of setulae; ventral process long . . . . *bispina* Lw.

5. Male with the 6th dorsal segment of abdomen very much longer than 5th . . . . *inaequalis*, new species.

Male with 5th and 6th abdominal segments subequal 6

6. Male with a row of moderately long hairs on the postero-ventral surface of hind femur; ventral abdominal process very long and slender . . . . *tenuispina* Lw.

No long hairs on postero-ventral surface of hind femur *aequalis*, new species.

I have not included in the table the females of several of the species as I have but the male of *aequalis*, and the others present but few characters that would permit of their tabulation. If the absence of the preapical bristle from the hind femur is a constant character, as I believe it to be, in *inaequalis* it should be easy for one to recognize the female of this species, but the others are very closely allied and are very difficult to separate without the presence of males.

Sapromyza harti sp. nov.

(Figs. 3, 7, 8, and 14.)

Male.—Subopaque, yellow, thorax including pleurae, with a grayish or brownish tinge and distinct grayish pollinosity. Abdomen sometimes brownish dorsally. Legs entirely yellow. Wings clear, veins yellow, the outer cross vein slightly more distinct than the others. All parts of the head, except arista, yellow; arista brown. Halteres yellow. All bristles black.

Frons slightly buccate, almost one-half the head width; all frontal bristles strong; post-vertical pair widely separated; about equal in length to the anterior orbital pair; profile of head as shown in Fig. 3; arista pubescent; cheeks bare. Mesonotum with 4 pairs of very strong dorsal-centrals, the anterior hardly weaker than the prescutellar pair; 2 rows of short but strong acrostichals present, disc of scutellum bare; pleural bristles normal, very strong, the usual hairs very sparse and indistinct on mesopleura and sternopleura. Abdomen shorter than thorax, distinctly tapering posteriorly and keel-shaped (Fig. 8); the bristles conspicuous on posterior margins of segments. Legs stout; all tibiae with strong preapical bristles, mid pair with 3–4 distinct apical spurs; hind femur with a series of bristles on apical third of antero-ventral surface (Fig. 14); hind tibia without any noticeable hairing on ventral surface. Wing with veins 3 and 4 parallel apically; last section of fourth about 1½ times as long as penultimate section; outer cross vein oblique, its upper extremity nearer to wing tip than its lower. Length, 3.75–4.5 mm.

Female.—Similar in size and coloration to the male. The abdomen is figured on the plate, Fig. 7. The hind femur has usually only two bristles in place of the graduated row present in the male.

Locality.—Quincy, Illinois, August 12, 1889; swept on sand bar (C. A. Hart). Paratypes and Allotypes: Same locality, August 14, 1889. Named in honor of Mr. C. A. Hart who collected the species.

Sapromyza cilifera sp. nov.

(Fig. 15.)

Male.—Entirely yellow, shining, only the head parts opaque. Wing clear, veins yellow; outer cross veins hardly more distinct than other veins, arista brown. Dorsum of abdomen slightly discolored, but probably normally yellow.

Frons about two-fifths the head width, bristling normal; head in profile almost as in *similata*, the anterior bristle not so far forward; arista long haired, but not plumose, the longest hairs being equal to rather less than half the width of the third antennal joint; marginal hairs on cheeks distinct; cheek as in *similata*. Mesonotum with 4 pairs of dorso-centrals, the anterior pair strong and well in front of suture; 2 rows of acrostichals present, the anterior 2–3 pairs weak; scutellum and pleura as in *harti* except that the bristles are rather weaker. Abdomen slightly longer than thorax; hypopygium very large and knob-like, in type specimen almost as long as remainder of abdomen; abdominal segments subequal; apical bristles moderately strong on the last 3 segments, weak on the anterior 3; surface of dorsal plate of hypopygium bare on the basal half; scattered hairs present on apical half; the hairs are much longer on the plate which forms the apical portion of the reversed surface of hypopygium; last ventral segment of abdomen with the lateral projections much the same shape as in *tenuispina* but much shorter; the rounded ventral lamellae of the hypopygium almost bare. Hind femur, on the postero-ventral surface, with a row of long, soft hairs of irregular length and not regularly arranged, one of which, near base, is most conspicuous; hind tibia as in Fig. 15; all tibiae with preapical bristle. Wings rather long and narrow; last sections of veins 3–4 subparallel; last section of fourth vein about 1¼ times as long as the penultimate section. Length, 3.5 mm.

Type.—Urbana, Illinois. swept from box elder, May 24, 1888 (C. A. Hart). I have not seen a female of this species, which is represented in the Illinois State Laboratory of Natural History by the type specimen only.

Sapromyza seticauda sp. nov.

(Figs. 8, 12, and 13.)

Male.—Yellow; head parts opaque, thorax and abdomen subopaque, the former lightly gray dusted. Wings clear, veins yellow. All bristles black.

Frontal bristles strong, normal in number, ocellar region with 2–3 pairs of short setulae in addition to the ocellar bristles; arista yellow at base, brownish beyond, distinctly haired, the longest hairs are about equal in length to one-third the breadth of third antennal joint; profile of head very similar to that of *inaequalis* (Fig. 16) but the cheeks are not as strongly haired. Mesonotum strongly haired, 4 pairs of strong dorso-centrals present; 2 rows of acrostichals, which are very close placed serially and increase rapidly in strength from in front; besides the acrostichal rows there are several irregularly arranged hairs between the dorsocentrals and the acrostichals; pleurae with the normal bristles; disc of scutellum bare, apical bristles cruciate. Abdomen equal in length to thorax; base broad, gradually tapering from middle, lateral view as in Fig. 9, the 7th segment very conspicuously setulose laterally; the ventral organs are exposed in the type, as drawn, but this is not the normal condition of the hypopygium, those organs generally lying close up against the ventral surface so that it is impossible to discover their true form without relaxing the specimen. Legs rather strongly bristled, but the bristles occupying only the usual area, *i. e.* the postero-dorsal and posteroventral surfaces of fore femur, the anterior surface, apical half, of mid femur, and the single preapical antero-ventral bristle on hind femur; all tibiae with preapical bristle; postero-ventral surface of hind femur with scattered, rather long, weak hairs, the most conspicuous one being near apex, hind tibia with a series of long hairs on basal third. Wing as shown in Fig. 12. Length, 3.5 mm.

Type.—Havana, Illinois, July 14, 1910.

Female.—Similar to the male in size and coloration. Differing in shape, etc., of abdomen, which is broad at base and tapers very much posteriorly, 6th segment short; apices of all segments with black bristles. Legs with the same bristles as in the male, but the soft hairs are absent from both the hind femur and hind tibia. The thoracic chaetotaxy is similar to that of the male.

Allotype.—Same data as type. Type and allotype in Illinois State Laboratory of Natural History.

Sapromyza bispina Loew.

(Fig. 11.)

Syn: *Sapromyza bispina* Loew, Dipt. Amer. Sept., Indig: Cent., 1, 1861, species 79.

This species differs from the foregoing in being much more slender; the abdomen is distinctly longer than the thorax; the hypopygium is very large and knob-like, and there is no conspicuous group of setulae as in *seticauda;* the hind femur has soft hairs on the antero-ventral surface which increase in length and strength to just before the preapical bristle, where the last one is almost bristle like; postero-ventral surface bare except at base; hind tibia as in *seticauda*.

The thoracic chaetotaxy is as in *seticauda*. The cheek is distinctly higher than in the preceding species, being almost half as high as the eye; the bristling of frons is the same in both species, but rather stronger in *bispina*. The female of this species may be separated from that of *seticauda* by the higher cheek, which in the latter is barely one-third the eye height; its more obscure brownish yellow color; the longer sixth abdominal segment, which is about as long as the fifth, and its rather larger size. Length, 3.75–4.5 mm.

In the Illinois State Laboratory of Natural History there are specimens from the following Illinois localities: White Heath; St. Joseph; Algonquin; Champaign; Quincy; and Urbana.

Melander in his recent synopsis of this family suggests the probability of *connexa* Say, being the female of this species, but the acceptance of this synonymy is not desirable, because of the number of species to which Say's description would apply more or less fittingly, unless one is particularly anxious to preserve Say's name. There is a female in the material here named by Coquillett as *connexa* Say which is undoubtedly *bispina* Loew.

Sapromyza inaequalis sp. nov.

(Fig. 16.)

Male.—Reddish yellow, slightly shining, head parts opaque. Arista brown, yellow at base. Wings clear, veins yellow, the cross vein being slightly more distinct than the other veins. All bristles black.

Profile of head as shown in Fig. 16; arista very short haired; hairs on occiput and cheeks more distinct than usual. Arista pubescent. Mesonotum with 4 pairs of dorso-central bristles, the front pair strong; acrostichals moderately strong and close serially, between the rows and the dorso-centrals there are a few scattered hairs; bristling of pleurae and scutellum normal. Abdomen longer than thorax, broad at base, slightly tapering to apex; sixth segment very distinctly elongated, in type equal in length to the 3 preceding segments; apices of all segments with distinct bristles; hypopygium large, projecting slightly less than length of sixth segment, surface with numerous hairs; last ventral segment with lateral processes as in *bispina* but not so long nor broad; the protruding recurved process small, weakly haired. Legs normal in shape; all tibiae with preapical bristle; hind femur without any preapical postero-ventral bristle; hind tibiae not noticeably haired; surfaces of legs with the small hairs rather distinct. Wing venation as shown in Fig. 12. Length, 3 mm.

Type.—Urbana, Illinois, May 9, 1891 (C. A. Hart).

Female.—Similar to male in color and chaetotaxy. The abdomen is broadly ovate, the segments slightly decreasing in length to apex, the apical one rather longer than subapical; all segments with distinct apical bristles. Hind femur without preapical bristle, as in male.

Allotype.—Urbana, Illinois, May 27, 1890 (C. A. Hart).

I believe from the condition of the specimens before me that the preapical bristle is normally absent from the hind femur.

Sapromyza tenuispina Loew.
(Fig. 10.)

Syn: *Sapromyza tenuispina* Loew, Dipt., Amer. Sept. Indig: Cent. I, 1861, species 80.

Male.—Differs from *bispina* Loew, as follows:

Hind femur with moderately long, irregular hairs on the entire length of its postero-ventral surface, the antero-ventral surface with only very short hairs in addition to the preapical bristle; hind tibia without loose ventral hairs; abdomen much as in *bispina* but the last ventral segment shaped as in Fig. 10. In other respects similar to *bispina*.

Female.—Similar to the female of *bispina* except that it is rather more slender and the disc of the mesonotum is not inclined to grayish or brownish and is distinctly shining.

Represented in the material before me by one male and four females, Odin, Illinois, May 20, 1910, in a meadow (C. A. Hart); one female, White Heath, Illinois, May 18, 1889, in a wood (Marten).

Although Loew states that the cross veins are not blackened I find that the specimens above mentioned are just as distinctly marked in this respect as those belonging to *bispina*. I believe, however, that there can be no mistake as to the identity of the above form with Loew's species because of the very peculiar character of the ventral processes.

Sapromyza aequalis sp. nov.

Male.—Similar to *tenuispina* Loew, except that the anterior pair of dorso-centrals are weak; the ventral abdominal process is rather shorter, and the hind femur has no hairs on the postero-dorsal surface, these being confined to the apical half of the antero-ventral surface, and very inconspicuous. In all other respects very similar to the foregoing species. Length, 3.75 mm.

Type.—Algonquin, Illinois, August 8, 1895 (Nason).

With the type there is another specimen which may possibly represent another species. It has only three pairs of dorso-centrals, but owing to the fact that the anterior pair in the type are considerably reduced in size, and that the second specimen is not in very good condition, I prefer to leave the specimen as possibly identical with the one from Algonquin. Locality of second specimen, Urbana, Illinois, June 28, 1889 (C. A. Hart).

Sapromyza incerta sp. nov.

This species is almost identical in color and general appearance with *philadelphica* Macquart but may be separated from the latter by the following characters: The mesonotum has only three pairs of strong dorsocentrals, and in front of the suture one very strong pair of bristles which may be mistaken for the anterior pair of dorso-centrals, but which are on almost the exact line of the much weaker acrostichals, posteriorly the acrostichals are much weaker than this pair, and anteriorly the acrostichals are weak hairs; in *philadelphica* the dorso-centrals are four in number, the anterior pair being in front of suture and slightly more widely separated than the posterior pairs, while the acrostichals are carried forward to at least the transverse line of the anterior pair of dorso-centrals at almost the same strength on their whole extent, anterior to this part they are represented by weak hairs. This difference holds good for both sexes. The genitalia of the males present minor differences which support the evidence of the throacic chaetotaxy. I have not sufficient material to permit of the dissection of those organs at present before me, but an examination of the type specimen of *incerta* the outer lamella shows that the lower arm is slender and directed downward on the apical half, whereas in *philadelphica* this arm is considerably thicker, somewhat spatulate at the tip and but little deflected; the central lobe-like processes in *incerta* are rather smaller than in *philadelphica* and rather shorter haired. The legs are similar in the species, and the wings in both are marked as in *similata*.

Locality.—Plummers Island, Maryland, August, 1912. Three females, including type.

Allotype.—Washington, D. C., September 2, 1907. One male.

In collection of W. L. McAtee.

There are two examples, a male and a female, in the collection of the Illinois State Laboratory of Natural History, the male from Urbana, Illinois, September 15, 1891 (Marten), and the female from Aldridge, Illinois, August, 1891 (Hart and Shiga).

Lonchaea vibrissata sp. nov.

(Fig. 1.)

Female.—Glossy blue-black. Antennae brownish black, surface of third joint with a whitish bloom; face distinctly white pollinose; palpi black. Mesonotum and abdomen without traces of pollen. Legs black, basal two joints of all tarsi bright fulvous. Calyptrae yellow, fringe brownish. Wings clear, veins yellowish. Halteres black, stalk yellow.

Frons occupying about one-third the width of head, slightly wider at center than at vertex or anterior margin; bristling normal, surface hairs weak; from above middle the surface is pitted with large irregular punctures which extend to the surface of the lunule; antenna reaching barely to the epistome, rather short, third joint less than twice as long as its greatest breadth; arista bare; cheek narrow, the glossy lower posterior part with numerous short hairs, and near to the anterior margin one strong, up-turned bristle. Thorax haired as in *polita* Say. Abdomen with seven distinct segments. Wing veins 3 and 4 slightly convergent at apices; last section of fourth vein longer than penultimate section (3.2), outer cross vein about two-thirds as long as section of 4 anterior to it. Length, 2.5–3 mm.

Locality.—Algonquin, Illinois, October 16, 1894 (Dr. Nason). Paratype: May 10, 1897, same locality and collector. Type and paratype: Illinois State Laboratory of Natural History.

Lonchaea winnemanae sp. nov.

(Fig. 18.)

Male.—Glossy blackish-blue. Frons black, subopaque, the upper portion of the orbits, to just below the orbital bristle, polished blackish-blue. Antennae black, the base of third joint on inner surface brown black; face slightly grayish pollinose; proboscis and palpi black. Halteres black. Squamae white, fringe concolorous. Legs shining black; tarsi yellow, last three joints blackened. Wings clear, veins yellowish brown, fifth vein most distinct.

Frons about one-fourth the head width, slightly converging to lunule, surface with distinct hairs, those on the lateral margins more than half as long as width of frons; face retreating slightly, not keeled; antennae elongated the third joint reaching to epistome, tapering slightly on apical half, about 3 times as long as broad at broadest part; arista but little swollen at base, tapering, almost bare, cheek small, marginal hairs becoming longer anteriorly, the longest one setutose, upcurved, above the longest one there are several weaker hairs, palpi normal, short haired, mesonotum with the discal hairs long and numerous; bristling as in *polita* Say; mesopleura with the same bristles as in *polita* but the surface hairs longer. Abdomen short and broad, ovate, in type the breadth slightly exceeding the length; surface haired as in *polita*. Legs hairy; hind femora with a row of bristles on the antero-ventral surface, which are very short, hair-like, and closely placed to middle, and from that point represented by about 6 bristles, the first of which is about the length of the femoral diameter, the third one becoming suddenly longer and stronger, about 1½ times as long as diameter of femur, and the other three tapering to the apical one which is subequal in length with the first. Venation almost identical with that of *polita*. Length, 4.5 mm.

Locality.—Virginia shore of the Potomac River near Plummers Island, Maryland, April 18, 1909 (W. L. McAtee).

Allotype.—Algonquin, Illinois, May 23, 1895 (W. A. Nason).

Lonchaea nudifemorata sp. nov.

(Fig. 19.)

Male.—Glossy blue-black, the abdomen less distinctly bluish than the thorax. Frons opaque black, orbits to just below the orbital bristle, and ocellar triangle blue-black, glossy; base of third antennal joint on the inner side yellowish, otherwise the antennae are black; palpi and proboscis black, the latter brownish at apex. Pleurae glossy, metallic blue-black on central portions, brown black above coxae and posteriorly. Legs shining, black; tarsi yellow, apical 3 joints of fore pair, and apical 2 joints of middle and hind pairs browned. Squamae whitish yellow, fringe concolorous. Halteres entirely black. Wings clear, veins yellowish brown.

Frons distinctly narrowed anteriorly, at its narrowest part about one-seventh the width of head; frontal hairs neither long nor numerous; antennae reaching to epistome, third joint almost parallel-sided, the apex slightly rounded, its length about 2½ times its greatest width; apical dorsal bristle on second joint distinct and rather long, its length equal to breadth of third antennal joint; cheek linear, the marginal bristles rather numerous, upturned anteriorly, and arranged in an irregular row; palpi slightly broadened, with scattered hairs on surface. The mesonotum has the bristling as in *polita* but the hairs on disc are very closely placed and their length is about equal to that of the dorsal hair on second antennal joint or slightly longer. Abdomen very short and broad, not exceeding in length that of the thorax, broad to apex of fourth segment, the fifth rather abruptly tapering; surface of all segments with numerous hairs; the ventral, protuberant portions of the hypopygium are yellowish. Legs rather strong; fore femora with strong ventral bristles, mid femora more weakly bristled, the bristles strongest on the postero-ventral surfaces; hind femora bare on both the antero- and postero-ventral surfaces, all legs with short surface hairs. Outer cross vein of wing slightly waved; third vein at its apex slightly upcurved; otherwise the wing venation is similar to that of *polita*. Length, 5 mm.

Locality.—Plummers Island, Maryland, April 21, 1912 (W. L. McAtee), one specimen.

This species differs from *polita* Say, which it most closely resembles, in having the hind femora bare on the antero-ventral surface, except for some very short setulae at near apex; the broader third antennal joint; the slightly sinuous outer cross vein and the more robust build of the insect over all.

There are 2 females in the Illinois State Laboratory of Natural History collection which I consider belong to this species.

These differ from the male only in having the eyes much more widely separated, at the anterior, or lower margin; the width of frons is about equal to two-thirds that of either eye at same part; the base and almost the entire under surface of third antennal joint is yellowish; and the wings are distinctly yellowish, with all the veins deep yellow.

The type specimens of *winnemanae* and *nudifemorata* are in the collection of W. L. McAtee and the allotypes are in the collection of the Illinois State Laboratory of Natural History.

Lonchaea albiceps sp. nov.

Female.—Glossy black, with but slight indications of a bluish tinge, except on the frons which is distinctly bluish when viewed from above and behind. The face and its sides, when viewed from above, with very distinct white pollinosity; antennae black, arista concolorous; proboscis and palpi black. Legs black, basal tarsal joint on all legs yellowish, the remainder of tarsi blackened. Squamae black-brown, fringe concolorous. Halteres black. Wings very slightly grayish, veins yellowish brown.

Frons one-third as wide as head, slightly wider at above antennae than at vertex; orbits not differentiated from central stripe at any part, the single orbital bristle rather weak, and but little anterior to the transverse line of the anterior ocellus; surface of frons almost bare, a short, uniserial row of hairs on lower part of frons close to eye margin; at middle of frons, in type specimen, there is a transverse depression, which is carried down to some extent on either side, giving the frons a rather distinct concavity; lunule rather small, arched; face broad, the eye margins sloping away very rapidly, so that at the lower margin of eye the face is twice as broad as at lower margin of frons; antennae short, falling but little short of epistome, third joint slightly longer than broad, rounded at apex, arista bare, slightly swollen, and geniculated at base, its length equal to anterior width of frons, cheek about one-fourth the height of eye, margin with short hairs, and a distinct bristle very similar to that which occurs in *vibrissata*, palpi slightly spatulate. Mesonotum with the discal hairs comparatively rather short and sparse, the anterior pair of dorso-centrals much reduced in size; scutellum with the basal pair of bristles placed well back from the lateral margins, no hairs on scutellum besides the bristles. The ovipositer ends in an acute point, without the preapical constriction as in *polita* Say. Fore and mid femora with bristles on the ventral surfaces, which are not very strong, the hind pair without bristles; tarsi not particularly thickened. Last section of vein 4 about 1¾ times as long as penultimate section; inner cross vein at beyond end of auxiliary vein; outer cross vein slightly waved; last sections of veins 3 and 4 slightly convergent. Length, 2.75 mm. (exclusive of ovipositor).

Locality.—Washington, D. C., May 29, 1912 (W. L. McAtee). One specimen.

Type in collection of W. L. McAtee.

This may be the species Melander lists in his paper on the family* as *parvicornis* Zett., but I consider that it is not identical with the European form and even if I were mistaken as to this the name *parvicornis* is not tenable, so that the name here given will have to be adopted for our American species.

Lonchaea quadrisetosa sp. nov.

Female.—Glossy black. Frons slightly shining; orbits to just below the orbital bristle, and the ocellar region glossy; antennae brown-black, arista concolorous; face and lunule viewed from above with whitish pollinosity; palpi and proboscis black. Mesonotum, scutellum and pleurae glossy black. Abdomen glossy black, without distinct pollinosity. Legs glossy black, the tarsi opaque, brown black, but not at any part yellow. Squamae and their fringes deep brown. Halteres black. Wings slightly smoky, veins brown. All hairs and bristles black.

Frons parallel-sided, one-third the width of head, surface covered with distinct sparsely scattered hairs; orbital bristle strong; bristle on dorsal surface at apex of second antennal joint as long as breadth of third joint, hair-like; third joint about 1½ times as long as broad, reaching three-fourths the length to mouth margin; arista distinctly longer than anterior width of frons, very shortly pubescent; face short, the upper margin of basal joint of antenna at middle of profile; face twice as wide at lower margin of eye as at base of antennae, the eye margins sloping back very abruptly; cheek with a row of bristles beginning near eye margin posteriorly and running diagonally downward to anterior angle, the last 4 bristles very strong, cheek glossy at base of bristles; below the level of this row of bristles there are numerous short hairs and several stronger bristles; palpi normal. Mesonotum rather long haired on disc; pleural bristles very strong; scutellum bare except for 4 subequal marginal bristles. Abdomen broadly ovate; ovipositor in type specimen not exserted far enough to show its structure, but the apex is sharp. Legs strong; fore and mid femora with rather strong ventral bristles, the hind pair without strong bristles. Last section of fourth vein about $1\frac{1}{3}$ times as long as penultimate section; outer cross vein slightly sinuate; inner cross vein at below end of first vein; last sections of veins 3 and 4 slightly convergent. Length, 3.5 mm.

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* Psyche, Vol. 20, 1913, p. 57.

Locality.—Plummers Island, Maryland. August 11, 1912 (W. L. McAtee).

This species is most closely allied to *deutschi* Zetterstedt, but that species is but slightly shining, and the abdomen opaque black, through the presence of distinct pollinosity. The cheek in *deutschi* is also said to be linear and no mention is made by Becker of the presence of strong bristles which are a feature in the present species. Melander records *deutschi* from Alaska and Washington. I have not seen American examples of the latter.

Type in collection of W. L. McAtee.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

FOUR NEW BIRDS FROM NEWFOUNDLAND.

BY HARRY C. OBERHOLSER.

In a collection of birds made recently in Newfoundland by Dr. L. C. Sanford there are specimens of four apparently undescribed subspecies. This collection, which Dr. Sanford has very kindly permitted the writer to examine, contains also such interesting Newfoundland birds as *Cyanocitta cristata* (Fox Island River, July 1, 1912; and Harry's River, June 30, 1913); *Oporornis philadelphia* (Fox Island River, June 17, 1912, and July 10, 1912); and *Penthestes atricapillus atricapillus* (Harry's River, June 27, 1913, and June 30, 1913). The new birds are of considerable interest, and indicate that we know as yet comparatively little concerning the Newfoundland avifauna. The endemic forms of Newfoundland, so far as known, show, as might, of course, be expected, decided affinities to their Labrador representatives. The present new birds are, by courtesy of Doctor Sanford, described below.

All measurements are in millimeters. The names of colors are from Mr. R. Ridgway's recently published "Color Standards and Color Nomenclature."

Dryobates pubescens microleucus subsp. nov.

Chars. subsp.—Similar to *Dryobates pubescens medianus*, but tail decidedly longer; superior wing-coverts with fewer and smaller white spots; wing-quills with smaller white spots; lower surface usually more smoky brownish; and white dorsal stripe with often black spots or short streaks.

Description.—Type, adult female, collection of Dr. L. C. Sanford; Fox Island River, June 29, 1912; Dr. L. C. Sanford. Upper parts, including wings, sides of head, and sides of neck, mostly black, the primaries somewhat brownish; a broad nuchal band scarlet vermilion; and a broad superciliary stripe, a broad subocular and subauricular stripe, which, prolonged, almost encircles the hind neck, a broad dorsal stripe (interrupted, however, by spots and streaks of black), a subterminal roundish spot on each of the greater and median (not on lesser) wing-coverts, several pairs of roundish spots on each wing-quill, all white; nasal plumes brownish white; two middle pairs of tail-feathers black; the next pair black but terminal third white; remaining pairs mostly white barred with brownish black; lower surface light smoke gray, a little paler on throat and crissum, the latter somewhat spotted with dull black; lining of wing dull white, a little varied with black; edge of wing black.

Measurements.—Male:* Wing, 91.3–97 (average, 93.8) mm.; tail, 59–65 (60.7); exposed culmen, 13.5–16.7 (15.1); tarsus, 14.8–16.5 (15.8); middle (*i. e.*, outer anterior) toe, 10.

Female:† Wing, 93–96 (94.3); tail, 61–63 (62); exposed culmen, 14.8–15.5 (15.1); tarsus, 15.7–16.5 (16.1); middle (*i. e.*, outer anterior) toe, 10–10.5 (10.2).

Geographical distribution.—Newfoundland.

Remarks.—It is rather surprising to find a form of this species geographically so near *Dryobates pubescens nelsoni*, and yet so different from it, even more so than is *Dryobates pubescens medianus*. For this new downy woodpecker differs markedly from *Dryobates pubescens nelsoni* in its smaller size, smoky under surface, less heavily black-barred outer rectrices, often black-spotted or black-streaked white dorsal stripe; smaller white markings on the wing-quills, and smaller, fewer white spots on the superior wing-coverts. In this last character *Dryobates pubescens microleucus* approaches *Dryobates pubescens homorus* and the other western races of the species, and bears interesting correspondence to the Newfoundland race of *Dryobates villosus*, *Dryobates villosus terraenovae*, which differs from the other eastern forms of that species in the same way, and likewise thus resembles the western subspecies *Dryobates villosus leucothorectis* and others. All the specimens examined are included in the appended table of measurements. We have seen none except from Newfoundland.

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* Six specimens, from Newfoundland.

† Three specimens, from Newfoundland.

Measurements of specimens of *Dryobates pubescens microleucus*.

Males.

Museum and Number.	Sex and Age.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
U.S.N.M. 190,286	♂ ad.	Balena, Newfoundland	June 27, 1903	W. Palmer .	94.	60.5	14.	16.5	10.
U.S.N.M. 202,562	[♂ ad.]	Locke's Cove, Newfoundland . .	April 1, 1906	O. Bryant . .	97.	65.	15.5	16.3	10.
U.S.N.M. 202,561	♂ ad.	Canada Bay, Newfoundland . .	April 14, 1906	O. Bryant . .	93.	59.	13.5	15.5	10.
L. C. Sanford . .	♂ ad.	Fox Island River, Newfoundland	June 9, 1912	L. C. Sanford	95.5	60.	16.7	16.5	10.
L. C. Sanford . .	♂ ad.	Fox Island River, Newfoundland	June 17, 1912	L. C. Sanford	92.	59.	. . .	15.	10.
L. C. Sanford* . .	♂ ad.	Fox Island River, Newfoundland	June 29, 1912	L. C. Sanford	91.3	. . .	16.	14.8	10.
Average of six males					93.8	60.7	15.1	15.8	10.

Females.

Museum and Number.	Sex and Age.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
L. C. Sanford . .	♀ ad.	Fox Island River, Newfoundland	July 9, 1912	L. C. Sanford	96.	63.	15.5	15.7	10.5
L. C. Sanford . .	♀ ad.	Fox Island River, Newfoundland	June 19, 1912	L. C. Sanford	93.	61.	14.8	16.	10.2
L. C. Sanford . .	♀ ad.	Fox Island River, Newfoundland	June 25, 1912	L. C. Sanford	94.	62.	15.1	16.5	10.
Average of three females					94.3	62.	15.1	16.1	10.2

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* Type.

Bubo virginianus neochorus subsp. nov.

Chars. subsp.—Similar to *Bubo virginianus heterocnemis*, but smaller, excepting the bill; upper parts lighter, the dark ground color less deep and more broken, the light markings more numerous; lower parts with rather less of dark color; feet and legs less heavily mottled with dark brown.

Description.—Type, adult female, collection of Dr. L. C. Sanford; Fox Island River, Newfoundland, July 8, 1912; Dr. L. C. Sanford. Upper surface fuscous, much mottled, vermiculated and irregularly barred with brownish white, and on the subterminal portions of the feathers, mostly concealed, with ochraceous buff and light ochraceous buff; "horns" fuscous black, laterally marked with irregular areas of buffy white and ochraceous; superior wing-coverts and tertials like the upper parts; wing-quills sepia, the outer webs with broad, broken and mottled bars of brownish white or buffy, the inner webs with the same kind of bars on their terminal portions, only more faintly indicated, and basally becoming ochraceous buff on the inner portions of the webs; middle rectrices fuscous, the rest sepia, all with mottlings and broken bars of brownish white, pale brown, buff or pale ochraceous buff; extreme forehead, nasal plumes, and supraloral streak white, much mixed with fuscous and fuscous black; facial disk mixed dull grayish white, ochraceous, buff, blackish, and fuscous, and bordered behind by a black band which joins the black horns; sides of neck grayish white, much mottled, streaked, spotted, and barred with fuscous, and on the subterminal portions of the feathers with ochraceous buff; chin and throat white, separated from each other by a band of fuscous the feathers of which have such broad ochraceous, ochraceous buff, and buff margins that the general appearance is light; breast ochraceous buff, with blotches, bars and mottlings of fuscous and white; remainder of lower surface white or buffy, laterally with much of ochraceous buff, and everywhere conspicuously barred with fuscous; tibiae ochraceous, tarsi ochraceous buff, both somewhat mottled and irregularly barred with fuscous, the toes buff, almost immaculate; lining of wing ochraceous buff, much mottled and irregularly barred with fuscous and whitish.

Measurements.—Male:* Wing, 345 mm.; tail, 219; exposed culmen, 37.5; culmen from cere, 28; tarsus, 62.

Female:† Wing, 370–371 (average, 370.3) mm.; tail, 218–227 (148.3); exposed culmen, 39–45 (41.5); culmen from cere, 28–33 (30.3); tarsus, 62–70 (67.3).

Geographical distribution.—Newfoundland and Nova Scotia.

Remarks.—This new form is apparently a very distinct race, differing from *Bubo virginianus heterocnemis* much more decidedly than does that form from *Bubo virginianus saturatus*. Although its small general size, lighter ground color of the upper parts, and reduced dark markings below, particularly on the legs and feet, are an indication of vergence toward *Bubo virginianus virginianus*, its general appearance is strikingly different from that of the latter race, for it is a grayish instead of a rufescent bird. From *Bubo virginianus virginianus* it may accordingly be readily distinguished by its lighter upper surface, the ground color of which is more grayish brown, the whitish and pale grayish markings more numerous, and the ochraceous areas lighter, less rufescent—ochraceous buff or buff instead of ochraceous or cinnamon rufous; facial disk and all of lower parts much more grayish and paler in general appearance, the ochraceous portions much lighter, and buffy or ochraceous buff, rather than ochraceous or cinnamon rufous. Also its bill is larger, though the other dimensions seem to be the same.

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* One specimen, immature though apparently full grown.

† Three specimens, two from Newfoundland, and one from Nova Scotia. One of the former is immature but seemingly of full size.

The material of this new form examined consists of three specimens from Newfoundland and one from Nova Scotia. Two of the former are immature birds, but with almost all of their adult feathering, and in size practically full grown. These two immature birds are identical in coloration with the adult from Newfoundland, though they are even less rufescent on the ochraceous areas, particularly on the legs and feet. Nor does the single adult example from Truro, Nova Scotia, differ in any essential particular from the Newfoundland birds, save that it is somewhat more rufescent on the ochraceous portions of the plumage, and has paler, nearly immaculate feet. It is evidently of the same race, and indicates that the range of *Bubo virginianus neochorus* extends to Nova Scotia. It is entirely possible also that birds from the neighboring areas of New Brunswick and northern New England, where occur many grayish individuals which we have heretofore referred to a supposed dark grayish phase of *Bubo virginianus virginianus*,* belong to the present new race. Such birds should, therefore, now undoubtedly be carefully compared with the present new form.

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* *Cf.* Oberholser, Proc. U. S. Nat. Mus., XXVII, 1904, p. 189.

Measurements of specimens of *Bubo virginianus neochorus.*

Males.

Museum and Number.	Sex and Age.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Culmen from cere.	Tarsus.
L. C. Sanford . .	♂ juv.*	Flat Bay, Newfoundland	July 18, 1912	L. C. Sanford	345.	219.	37.5	28.	62.

Females.

Museum and Number.	Sex and Age.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Culmen from cere.	Tarsus.
L. C. Sanford† . .	♀ ad.	Fox Island River, Newfoundland	July 8, 1912	L. C. Sanford	371.	. . .	45.	33.	70.
L. C. Sanford . .	♀ juv.*	Flat Bay, Newfoundland	July 18, 1912	L. C. Sanford	370.	227.	39.	28.	62.
L. C. Sanford . .	♀ ad.	Truro, Nova Scotia	Jan. —, 1913	. . . .	370.	218.	40.5	30.	70.
Average of three females					370.3	148.3	41.5	30.3	67.3

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* Partly in juvenal plumage, but wings and tail fully grown.

† Type.

Perisoreus canadensis sanfordi subsp. nov.

Chars. subsp.—Similar to *Perisoreus canadensis nigricapillus*, but even smaller; and the lower surface much paler, the crissum whitish.

Description.—Type, adult male, collection of Dr. L. C. Sanford; Fox Island River, Newfoundland, June 28, 1912; Dr. L. C. Sanford. Forehead, sinciput, lores, and a nearly complete cervical collar, brownish white; occiput, hinder part of crown, postocular region, and orbital ring, blackish brown; remainder of upper surface, including wings and tail, dark neutral gray, the wing-coverts rather darker and more brownish, and the rectrices broadly, the wing-quills more narrowly, tipped with pale brownish or brownish white; sides of head and neck, with chin and throat, brownish or grayish white; rest of lower parts rather light mouse gray, paling to pallid mouse gray on jugulum and crissum; lining of wing mouse gray.

Measurements.—Male:* Wing, 138–138.5 (average, 138.3) mm.; tail, 142; exposed culmen, 20.5; tarsus, 35–35.5 (35.3); middle toe, 16.5–16.8 (16.7).

Female:† Wing, 135–135.5 (135.3); tail, 135; exposed culmen, 20; tarsus, 35.5–35.8 (35.7); middle toe, 17–17.3 (17.2).

Geographical distribution.—Newfoundland and Nova Scotia.

Remarks.—This subspecies presents, in a way, a combination of the characters of *Perisoreus canadensis nigricapillus* and *Perisoreus canadensis canadensis*, but is noticeably different from either, though nearer to the former. Compared with the latter, it is much smaller; darker on the upper surface; and has the dusky hood more blackish, reaching farther forward, thus covering more of the crown, and more broadly surrounding the eyes. There is some variation in the color of the breast and upper abdomen, one specimen being very light gray, much paler than the others, which are fairly uniform in this respect; though the type is somewhat the darkest. A single specimen in the United States National Museum from Nova Scotia is much like these Newfoundland birds.

This new race is named for Dr. L. C. Sanford, through whose kindness it is here described.

In view of the successive division of *Perisoreus canadensis* into subspecies, it becomes advisable to restrict the typical form to a definite area. The original description of the species‡ was based entirely on Brisson's "Geay brun de Canada—Garrulus canadensis fuscus,"§ which was doubtless obtained in what was formerly the French portion of Canada; and we therefore designate the city of Quebec as the type locality.

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* Two specimens, from Newfoundland.

† Two specimens, from Newfoundland.

‡ [*Corvus*] *canadensis* Linnaeus, Syst. Nat., ed. 12, 1766, I, p. 158 (Canada).

§ Ornith., II, 1760, p. 54 (Canada).

Measurements of specimens of *Perisoreus canadensis sanfordi.*

Males.

Museum and Number.	Sex and Age.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
L. C. Sanford* . .	♂ ad.	Fox Island River, Newfoundland	June 28, 1912	L. C. Sanford	138.5	142.	20.5	35.	16.8
L. C. Sanford . .	♂ ad.	Fox Island River, Newfoundland	July 5, 1912	L. C. Sanford	138.	. . .	20.5	35.5	16.5
	Average of two males				138.3	142.	20.5	35.3	16.7

Females.

Museum and Number.	Sex and Age.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
L. C. Sanford . .	♀ ad.	Fox Island River, Newfoundland	July 5, 1912	L. C. Sanford	135.	. . .	20.	35.5	17.
L. C. Sanford . .	♀ ad.	Fox Island River, Newfoundland	July 12, 1912	L. C. Sanford	135.5	135.	20.	35.8	17.3
	Average of two females				135.3	135.	20.	35.7	17.2

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* Type.

Pinicola enucleator eschatosus subsp. nov.

Chars. subsp.—Resembling *Pinicola enucleator leucura*, from the mainland of northeastern North America, but decidedly smaller; male darker and duller above and below, on both the red and gray areas; female darker on upper and lower parts, the yellowish areas more purely yellow, less tinged with orange.

Description.—Type, adult female, collection of Dr. L. C. Sanford; Harry's River, Newfoundland, July 1, 1913; Dr. L. C. Sanford. Back and scapulars dark gray, between mouse gray and deep mouse gray, the feathers with narrow paler edges; crown and cervix orange-citrine, the feathers with dark brownish gray centers; rump and upper tail-coverts gray like the back but lighter, the feathers of the former slightly, those of the latter broadly, tipped with aniline yellow; rectrices and wings deep fuscous, the former narrowly margined on exterior webs with deep neutral gray, the lesser superior wing-coverts narrowly margined with orange-citrine, the greater and median coverts broadly tipped with white, this forming two conspicuous wing-bands; the wing-quills paler on inner margins, and narrowly edged on external webs with pale brownish or brownish white; subocular region pale olive gray; rest of sides of head between mouse gray and olive gray, more or less washed, particularly on the auriculars, with orange-citrine; lower surface gray in tone, between mouse gray and light mouse gray, paler, almost whitish on middle of abdomen, somewhat more brownish on crissum, and washed with orange-citrine on throat and breast; lining of wing like the crissum, but somewhat washed with orange-citrine.

Measurements.—Male:* Wing, 112–116 (average, 113.5) mm.; tail, 88–93 (90.7); exposed culmen, 14–15 (14.4); tarsus, 21.5–23.8 (22.7); middle toe, 16.5.

Female:† Wing, 104–106 (105.3); tail, 84–92 (86.9); exposed culmen, 13.8–14 (13.9); tarsus, 20.8–23.5 (24.8); middle toe, 15–16.5 (15.5).

Geographical distribution.—Newfoundland; south in winter to Massachusetts.

Remarks.—The differences separating this new race from *Pinicola enucleator leucura* are much the same as those distinguishing the Newfoundland *Loxia curvirostra percna*‡ from *Loxia curvirostra minor*, and the cases are interestingly parallel. The characters of *Pinicola enucleator eschatosus* are very constant in the series examined, and they seem to indicate an excellent race. Individual variation is about the same as in the other subspecies of *Pinicola enucleator*. An immature male in first autumn plumage (No. 202,569, U. S. N. M.), from Locke's Cove, Newfoundland, taken February 26, 1906, differs from specimens of *Pinicola enucleator leucura* in the same stage by reason of the darker, more grayish shade of the upper surface, slightly darker lower parts, and the somewhat smaller size. Size is, however, not an entirely reliable character for the determination of birds in immature plumage, since such individuals are frequently much smaller than adults. The dark grayish upper surface seems, however, to be a reasonably certain means of identification. An example of *Pinicola enucleator eschatosus* in juvenal plumage, from Newfoundland, differs from the juvenal stage of *Pinicola enucleator leucura* in its more grayish upper surface; the more greenish, less orange tint of the yellowish wash on the same area, particularly pileum, rump, and upper tail-coverts; darker, more grayish wings and tail; darker, more brownish wing-bars; and more grayish sides of head and lower parts.

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* Three specimens, from Newfoundland.

† Four specimens, from Newfoundland.

‡ *Loxia curvirostra perena* Bent, Smithson. Misc. Coll., Vol. 60, No. 15, December 12, 1912, p. 1 (Flat Bay River, Newfoundland).

A single immature male, No. 162,314, U. S. Nat. Mus., taken at Ponkapog, Massachusetts, January 22, 1893, by Mr. J. H. Bowles, is referable to *Pinicola enucleator eschatosus,* and indicates that this form is to be looked for all along the coast region of northeastern North America, from at least southern New England north to Newfoundland.

Actual comparisons of the present new form have been made with specimens of *Pinicola enucleator leucura* chiefly from Fort Chimo, Ungava, in extreme northern Quebec, but the latter is the common bird of all northeastern North America, excepting, of course, Newfoundland. It was originally described by Müller as *Loxia leucura,** and based on Buffon, with "Canada" as the type region. This, as Cassin has shown,† is intended to refer to Buffon's (*i. e.*, d'Aubenton's) plate of the "Gros-Bec, du Canada";‡ and also doubtless to his original description of the "Durbec" or "Gros-bec de Canada."§ Both description and plate are undoubtedly of the Pine grosbeak. Since the original of Buffon's description and d'Aubenton's plate came probably from the French portion of Canada, and since in view of the subspecific separation of the Newfoundland bird, it is desirable to restrict *Pinicola enucleator leucura* to a definite area, we designate the city of Quebec as the type locality, a place where it undoubtedly occurs at least in winter.

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* Linné Vollstand. Natursyst., Suppl. & Register Band, 1776, p. 150 (Canada).

† Proc. Acad. Nat. Sci. Phila., 1861, p. 252.

‡ D'Aubenton, Planch. Enlum. d'Hist. Nat., No. 135, fig. 1.

§ Buffon, Hist. Nat. des Oiseaux, III, 1775, pp. 457–458.

Measurements of specimens of *Pinicola enucleator eschatosus*.

Males.

Museum and Number.	Sex and Age.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
U.S.N.M. 190,289	♂ ad.	Balena, Newfoundland	July 6, 1903	W. Palmer .	112.	91.	14.	22.8	16.5
L. C. Sanford . .	♂ ad.	Fox Island River, Newfoundland	June 26, 1912	L. C. Sanford	116.	93.	14.2	23.8	16.5
L. C. Sanford . .	♂ ad.	Fox Island River, Newfoundland	June 26, 1912	L. C. Sanford	112.5	88.	15.	21.5	16.5
U.S.N.M. 202,569*	♂ im.	Locke's Cove, Newfoundland . .	Feb. 26, 1906	O. Bryant . .	109.	92.5	14.	21.	15.
Average of three adult males					113.5	90.7	14.4	22.7	16.5

Females.

Museum and Number.	Sex and Age.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
U.S.N.M. 202,568	♀ ad.	Locke's Cove, Newfoundland . .	Feb. 24, 1906	O. Bryant . .	106.	87.5	14.	22.8	16.5
L. C. Sanford . .	♀ ad.	Harry's River, Newfoundland .	July 21, 1913	L. C. Sanford	105.5	84.	14.	22.	15.2
L. C. Sanford† . .	♀ ad.	Harry's River, Newfoundland .	July 1, 1913	L. C. Sanford	104.	92.	13.8	20.8	15.
L. C. Sanford . .	♀ ad.	Harry's River, Newfoundland .	June 30, 1913	L. C. Sanford	105.5	84.	14.	23.5	15.3
Average of four females					105.3	86.9	13.9	24.8	15.5

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* Not used in measurement averages.

† Type.

Measurements of specimens of *Pinicola enucleator leucura*.

Males.

Museum and Number.	Sex and Age.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
U.S.N.M. 100,641	♂ ad.	Fort Chimo, Ungava, Quebec . .	June 20, 1884	L. M. Turner	117.5	95.	14.5	22.2	15.
U.S.N.M. 93,649	♂ ad.	Fort Chimo, Ungava, Quebec . .	May 1, 1883	L. M. Turner	116.	96.	14.	23.5	16.
U.S.N.M. 93,653	♂ ad.	Fort Chimo, Ungava, Quebec . .	May 9, 1883	L. M. Turner	123.	98.	14.	23.	15.2
U.S.N.M. 100,628	♂ ad.	Fort Chimo, Ungava, Quebec . .	April 13, 1884	L. M. Turner	121.5	99.	15.	23.5	16.
U.S.N.M. 93,647	♂ ad.	Fort Chimo, Ungava, Quebec . .	April 29, 1883	L. M. Turner	116.	96.	14.8	22.	15.
Average of five males					118.8	96.8	14.5	22.8	15.4

Females.

Museum and Number.	Sex and Age.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
U.S.N.M. 100,624	♀ ad.	Fort Chimo, Ungava, Quebec . .	June 18, 1884	L. M. Turner	108.	87.	13.5	22.5	15.2
U.S.N.M. 100,623	♀ ad.	Fort Chimo, Ungava, Quebec . .	June 29, 1884	L. M. Turner	112.5	92.	14.	21.5	16.
U.S.N.M. 93,661	♀ ad.	Fort Chimo, Ungava, Quebec . .	Aug. 24, 1882	L. M. Turner	113.5	92.5	14.	22.	16.
U.S.N.M. 93,668	♀ ad.	Fort Chimo, Ungava, Quebec . .	Aug. 16, 1882	L. M. Turner	117.	97.5	15.3	24.	16.3
U.S.N.M. 93,657	♀ ad.	Fort Chimo, Ungava, Quebec . .	April 19, 1883	L. M. Turner	112.5	92.5	14.5	23.	16.
Average of five females					112.7	92.3	14.3	22.6	15.9

11,001

Vol. XXVII, pp. 55-56 March 20, 1914

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NEW MOLES OF THE GENUS SCAPANUS.

BY HARTLEY H. T. JACKSON.

A continuation of my studies upon North American Talpidæ, for the U. S. Biological Survey, has shown that in order to properly elucidate the relationships of the forms of the genus *Scapanus* it is necessary to describe two new subspecies, diagnoses of which follow:

Scapanus latimanus sericatus subsp. nov.

Type, adult ♀, skin and skull, No. 109,548, U. S. National Museum, Biological Survey Collection, from Yosemite, Mariposa County, California; collected August 20, 1901, by W. K. Fisher. Original number, 2227.

General characters.—Smaller than *S. l. latimanus*, darker and more grayish in fresh pelage; larger and darker than *occultus* or *minusculus*; claws, especially of fore feet, longer and more slender than those of *S. l. latimanus*; skull relatively long, narrow, and flat.

Color.—Type, mostly in worn and faded summer pelage, fresh pelage appearing on the abdomen and flanks: upper parts glossy olive-brown;* under parts slightly paler than back; fresh pelage on abdomen dark mouse gray.

Measurements.—Type, measured in the flesh: Total length, 165; tail vertebræ, 36; hind foot, 21. Skull of type: Condylobasal length, 33.7; greatest length, 34.3; palatilar length, 13.3; breadth across mastoids, 16.2; interorbital constriction, 7.2; maxillary tooth row, 11.0; mandibular molar-premolar row, 10.4.

Remarks.—*S. l. sericatus* seems to be confined to the Yosemite region. It is intermediate in size between *S. l. latimanus* and *S. l. occultus*, in fresh pelage is darker than either, and has a relatively narrower skull.

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* Colors here used are those of Robert Ridgway in "Color Standards and Nomenclature," 1912.

Scapanus latimanus grinnelli subsp. nov.*

Type, adult ♂, skin and skull, No. 17,785, Museum of Vertebrate Zoology, University of California, from Independence (altitude, 3,900 feet), Inyo County, California; collected May 8, 1912, by H. A. Carr.

General characters.—Size small; slightly larger than *S. l. occultus* or *S. l. minusculus*, smaller than *S. l. sericatus;* color dark; skull short and high, broad interorbitally and through mastoids; rostrum short and wide.

Color.—Type, in worn and somewhat faded winter pelage: Upperparts between fuscous and fuscous-black; ventral parts slightly more grayish, stained on throat and chest with Dresden brown.

Measurements.—Type, measured in the flesh: Total length, 156; tail vertebræ, 31; hind foot, 21. Skull of type: Condylobasal length, 32.8; greatest length, 33.0; palatilar length, 13.1; breadth across mastoids, 17.0; interorbital constriction, 7.8; maxillary tooth row, 10.4; mandibular molar-premolar row, 10.0.

Remarks.—This subspecies is apparently the darkest form of the *latimanus* group. It is known only from the type locality and only two specimens have been examined; the characters in these two, except for a supernumerary maxillary premolar in the topotype, are remarkably uniform.

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* Named for Dr. Joseph Grinnell in recognition of his valuable studies upon the Pacific coast fauna, and who has kindly granted me the privilege of describing this form from the collection of the Museum of Vertebrate Zoology, University of California.

11,551

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

FOUR NEW NEOTROPICAL RODENTS.

BY N. HOLLISTER.

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Among the mammals from Middle and South America in the collection of the United States National Museum are specimens of four hitherto undescribed rodents.

Proechimys rubellus sp. nov.

Type from Angostura Valley, Costa Rica. Adult [♂]; collected by José C. Zeledón. U. S. National Museum No. $\frac{12901}{38587}$, skin and skull.

Characters.—Like *Proechimys centralis* and *P. c. chiriquinus*, but general coloration much more reddish, less dusky, with less mixture of grayish- and yellowish-buff and more bright hazel on cheeks and sides, and with little blackish suffusion in color of upperparts. Tail shorter. Skull as in *Proechimys centralis*.

Measurements of type (from dry skin).—Head and body, 250 mm.; tail, 130; hind foot, .55. Skull and teeth: Greatest length of skull, 64.7; condylobasal length, 52.3; nasals, 24.3; upper tooth row, alveoli, 9.2; mandible, 33.6; mandibular tooth row, 9.7.

Remarks.—While Nicaraguan specimens of *Proechimys centralis centralis* and topotypes of *Proechimys centralis chiriquinus* scarcely differ from each other in color, the Angostura Valley skins are sharply differentiated from each by their bright reddish-brown coloration. The superficial resemblance to *Proechimys minca* of Colombia is pronounced, but the new form is even more reddish in color and has a much shorter tail. Three specimens from the type locality are in the collection.

Myocastor coypus santacruzæ subsp. nov.

Type from north bank of Rio Salado, near Los Palmares, Santa Cruz, Argentina. Adult [♂]; collected by W. Frakes. U. S. National Museum (Biological Survey Collection) No. 96513, skin and skull.

Characters.—Larger and lighter colored than *Myocastor coypus coypus* of Chile; like *Myocastor bonariensis* (Geoffroy) from the Parana River, but lighter and more reddish brown, the long overlying hairs less buffy, more ochraceous. Skull like that of *bonariensis*, but larger, with posterior border of palate, as in true *coypus*, sharply Λ-shape [in *bonariensis* broadly rounded concave, with no sharp angle]. Upper molariform teeth increasing conspicuously in size from first backward, the last with nearly twice the crown area of first [in *coypus* and *bonariensis* in same state of wear the cheek teeth are much more uniform in size].

Measurements of type (from dry skin).—Head and body, 740 mm.; tail, 415; hind foot, with claws, 137. Skull: Greatest length, 122.5; condylobasal length, 113; zygomatic breadth, 74.9; length of nasals, 46.8; least interorbital breadth, 31.6; mandible, 108.5. Teeth: Upper molar-premolar row, alveoli, 29.8; pm–m^1, 11.8; m^2–m^3, 18; lower tooth row, alveoli, 33.9; pm–m_1, 13.5; m_2–m_3, 20.4.

Remarks.—Three races of *Myocastor coypus* are represented in the National Museum collections: *coypus* from Chile and Straits of Magellan, (Port Churruca; Borja Bay); *bonariensis* from Buenos Aires, Santa Fe, and Paraguay, Parana River; and *santacruzæ* from Rio Negros and Rio Salado, Patagonia.

Lagostomus maximus petilidens subsp. nov.

Type from 8 miles north of Carmen de Patagones, Argentina. Adult [♂] skull (basal suture entirely closed); collected by Dr. Aleš Hrdlička, 1910. U. S. National Museum No. 172,801.

Characters.—Skull of same essential size as in *Lagostomus maximus maximus*, but with the incisors very much smaller, slender and weak; cheek teeth averaging smaller; audital bullæ short and rounded; presphenoid much narrower and more tapering; opening of posterior nares much reduced, the post palatal space more sharply Λ-shape, less rounded; angle of jaw much smaller, lighter and more sharply tapering.

Measurements of type skull and teeth.—Greatest length of skull, 126 mm.; condylobasal length, 117; zygomatic breadth, 75.4; length of nasals, 52.9; length of mandible, to angle, 100.3; upper cheek teeth, alveoli, 27.2; mandibular tooth row, 27.8; total breadth of upper incisors at middle, 11.1 (13.8)*; depth of incisor, 5.5 (6.9).

Remarks.—This form is based on a series of fifty skulls collected by Doctor Hrdlička at various points from Necochea south to Rio Negro. Compared with skulls of true *Lagostomus maximus* from Buenos Aires, San Luis, and southern Paraguay, the conspicuously smaller, more slender, incisor teeth at once distinguish the southern form.

Hydrochœrus hydrochæris notialis subsp. nov.

Type from Paraguay. Old adult ♂, skin and skeleton, U. S. National Museum No. 154,186. Received at National Zoological Park January 6, 1909, from N. Ruffin; died June 25, 1909.

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* Measurements in parentheses from skull of an adult male *Lagostomus maximus maximus* from Buenos Aires.

Characters.—Skull less heavily built than in *Hydrochœrus hydrochœris hydrochœris* from Surinam; maxillary arm of zygoma much more slender, less massive; occiput shortened, actually and relatively much less elongated; presphenoid narrow and tapering anteriorly; lachrymal bone, lateral aspect, much higher than wide, extending far downward to sharp point [in *hydrochœris* wider than high and not sharply pointed on lower side]; jaw much lighter, lower posteriorly, and with inferior surface of angle much flattened; symphysis shorter; superior notch long and shallow [in *hydrochœris* shorter, much deeper, and more rounded]. Upper incisors smaller than in *hydrochœris;* cheek teeth smaller, the last upper molar especially much narrower; m^3 with double anterior lobe, ten transverse enamel plates [in *hydrochœris* nine] and posterior hooked lobe.

Measurements of type skull, compared with a very slightly older skull from Surinam (U. S. N. M. 13007), measurements of latter in parentheses: Greatest length, 237 (252); condylobasal length, 225 (228); zygomatic breadth, 126 (143); palatal length, 145 (150); coronal suture to occipital crest, 57 (69); height of lachrymal, 37.5 (21). Teeth: Single upper incisor at middle, 8.8 x 11.6 (9.7 x 12.2); maxillary tooth row, alveoli, 75.8 (79.8); greatest breadth of m^3, 13.6 (16).

Remarks.—This form is based on four specimens from Paraguay, all of which agree in the presence of the characters given above to distinguish the southern animal from the capybara of Surinam. The differences between skulls from the two regions are so pronounced, that were it not for two skulls in the collection from Brazil, which certainly show some intermediate characters, the specific distinctness of the two forms would never be questioned.

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Vol. XXVII, pp. 61-62 March 20, 1914

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW DELPHINIUM FROM UTAH.

BY IVAR TIDESTROM.

The new species described in this paper has hitherto been referred to the northwestern species *D. stachydeum*, first collected by Cusick in the Blue Mountains, Oregon.

Delphinium abietorum sp. nov.

Perennis e radice profunda crassa: caules metrales vel altiores, deorsum glabri, sursum pubescentes: folia inferiora ad basin fere 5-partita, longe petiolata, lobis cuneatis amplis incisis vel lobulatis; caulina simpliciora, 3–5-partita: inflorescentia e basi ad partem mediam ramosa vel simpliciter racemosa, plus minusve dense albido-pubescens, bracteis linearibus, bracteolis binis oppositis, racemis dense multifloris: flores coerulei vel violacei; calcar sepala superans, curvatum, 1.5 cm. longum; sepala oblonga ut calcar extus pubescentia: petala superiora albida vel pallide coerulea; inferiora coerulea vel violacea: carpella terna albido-pubescentia; matura fere erecta, 1.5 cm. longa, pubescentia. Fl. Aug. [Alt. 2700 m.].

Type in the U. S. National Herbarium [Coville and Tidestrom No. 19], collected August 22, 1908, in a draw near the watershed of the Muddy Creek and Gunnison River, Utah, at an elevation of 2700 m. Typical flowering and fruiting specimens were also collected on the western slope of the Wasatch Mountains east of Mount Pleasant at an altitude of 2700 m. [Tm. 1870]. It has been observed on Mount Nebo associated with *Rudbeckia occidentalis* at an elevation of 2200 m. or in the Aspen belt. At the latter elevation its flowering season appears to be 2 weeks earlier than in its natural habitat among the firs.

The species has the habit and stature of *Delphinium Barbeyi* [*D. scopulorum subalpinum* Gray], from which it is readily distinguished by its pubescence and color of the flowers. *D. Barbeyi* has a pubescence of yellowish stiff hairs and the new species is somewhat silky puberulent. The flowers of *D. Barbeyi* are generally dark blue with an occasional grading into cream-white or pink. *D. abietorum* is often associated with *D. Barbeyi*. It is distinguished from another related species—*D. glaucum* by its pubescent carpels and from *D. stachydeum* [*D. scopulorum* var. *stachydeum* Gray] by its leaves. The leaves of the latter are laciniate in the manner of *D. scopulorum* of New Mexico, the lobes being linear or nearly so. In our species the leaves have nearly the same form as in *D. Barbeyi*.

11,001

Vol. XXVII, pp. 63-68 March 20, 1914

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF THREE NEW RACCOONS FROM THE MEXICAN BOUNDARY REGION.

BY EDGAR A. MEARNS.

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On reviewing the material of the genus *Procyon* collected by the author on the Mexican Boundary Line and comparing it with that in the United States National Museum, three apparently new forms have been distinguished, which are described below.

Procyon lotor fuscipes subsp. nov.

BROWN-FOOTED RACCOON.

Type-specimen.—Adult male, Cat. No. 63055, U. S. Nat. Mus.; collected on Las Moras Creek, at Fort Clark, Kinney County, Texas (altitude 308 meters or 1011 feet), February 6, 1893, by Edgar A. Mearns. (Original number, 2273.)

Characters.—Largest of the raccoons; in color closely resembling *Procyon lotor lotor* (Linnaeus), but usually with six instead of five distinct blackish tail rings; feet dark brown instead of whitish; white on convexity of ear occupying only the apical half instead of nearly all of the outer surface; blackish mask expanded so as to cover all of the face and extending from the nasal pad well upon the forehead in the median line; skull elongate, compressed postorbitally, with slender lengthened rostrum; bony palate narrow, with lateral rows of teeth nearly parallel; interpterygoid notch narrow and deep; audital bullae long and flattened externally.

Color (based on adult male type).—Upperparts from nape to tail, pale gray, everywhere darkened by black tips to the long hairs, but darkest in the vertebral area posteriorly; nape washed with rust color, of which a slight trace is carried backward across the interscapular region, where, however, it is much less distinct than in *Procyon lotor lotor;* black mask solid and continuous across the face and along the side of the head to a point below the ear and also extending forward as a median band to the naked nasal pad and backward to the grizzled black crown; area bordering the black mask posteriorly, grizzled, not white; sides of muzzle and lower lip white; ear white on apical half of outer surface, black, slightly grizzled, on basal half, with a blackish band, about eighty-five milimeters in length, extending along the base of the ear and well behind it at the side of the neck; fore and hind limbs, including feet, fuscous with some admixture of grayish; tail with a black tip and six blackish rings, which become obsolete proximally on the under side; upper throat benzo brown; overhair of remaining underparts grayish white, the drab underfur everywhere visible between the scanty long hairs; underfur of upperparts fuscous; whiskers mostly white, some of the short anterior ones blackish drab, and a few of the longer ones tipped with the same.

External measurements of the type (old male; measured fresh by the author).—Total length, 900 mm.; tail vertebræ, 290; ear above crown, 58; hind foot, with claw, 132; longest whisker, 95; longest hairs on dorsum, 50.

Cranial and dental measurements of type, compared with measurements of largest adult male in a series of one hundred specimens of *Procyon lotor lotor*,* the latter in parentheses.—Condylobasal length, 125 (122); zygomatic breadth, 85 (80); breadth of braincase, 57 (56); postorbital constriction, 22 (25); interorbital constriction, 27 (25); rostral breadth over canines, 29 (30.5); least rostral breadth, 28 (28); from posterior border of middle incisor to interpterygoid notch, 72 (75); from the last point to the foramen magnum, 43 (38); length of interpterygoid notch, 17 (15); posterior breadth of interpterygoid notch, 18 (—); distance between anterior premolars, across palate, 19 (21); distance between posterior premolars, 20 (23); distance between posterior molars, 21 (26); length of audital bulla, 22.5 (20); length of mandible, 93 (91); length of upper lateral tooth row, including canine, 48 (46); combined length of upper molars, measured on crowns, 15 (15); length of upper incisor tooth row, measured on alveoli, 17 (16.5); length of lower lateral tooth row, including canine, alveoli, 54 (53); combined length of lower molars, measured on crowns, 21 (20); lower incisor tooth row, measured on alveoli, 13 (12).

Geographical range.—Devils River to Matamoras, south to San Luis Potosi.

Remarks.—A raccoon, very doubtfully from Texas and from no definite locality, was described by Gray as *Procyon nivea* (Charlesw. Mag. N. H., I, 1837, p. 580); but several forms of *Procyon* inhabit Texas, and, Gray's type of *nivea* being an albino, its identification is impossible.

Procyon lotor ochraceus subsp. nov.

SONOYTA RACCOON.

Type-specimen.—Male, subadult (skull with sutures remaining open, but all of permanent teeth in place), Cat. No. 59900, U. S. Nat. Mus.; collected on the Sonoyta River near Quitobaquita, at Monument No. 172, 678 kilometers (421 miles) west of the Rio Grande and 181 kilometers

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*Cat. No. 187926, U. S. National Museum; Elk River, Minnesota; from Merriam collection.

(113 miles) east of the Colorado River, altitude 360 meters (1181 feet), Sonora, Mexico, February 7, 1894, by Edgar A. Mearns. (Original number, 2937.)

Characters.—Skull and teeth indistinguishable from those of *Procyon lotor mexicanus* (Baird)* of similar age; color paler, more ochraceous, and with less black than in any other known form of *Procyon;* pelage extremely long and soft.

Color (based on the male type in winter coat).—Upperparts, from nape to tail, strongly tinged with buff; longest hairs narrowly tipped with drab-brown on thoracic region and sides, with much broader tips of brownish black in median lumbar and lower thoracic regions; underfur of dorsum light mouse gray at base, shading to mouse gray apically; face mask of the usual pattern, cinnamon-drab on upper side of muzzle, deepening to fuscous around and below eye, then paling to benzo brown on side of face posteriorly; sides of muzzle and its under surface white, this color extending broadly around angle of mouth and occupying the whole of the lower jaw; crown whitish anteriorly, next to the dark face mask, rapidly deepening to pallid purplish gray posteriorly, with the dense underfur drab; ears and whiskers entirely pure white; no blackish area on side of crown at base of ear; fore and hind limbs soiled, slightly yellowish, gray externally, grayish white internally; hands and feet clayey white; long overhair of underparts and inner surface of limbs grayish white, and so sparse that the light drab underfur everywhere shows through, imparting the general color to the underparts; tail yellowish white above, with five rings, of mixed brownish and yellowish long hairs, which become obsolete on the under surface; underfur of tail very pale drab above, and whitish drab below; underfur on throat light cinnamon-drab; naked parts of feet purplish black; claws horn color, or brownish on median upper surface.

Measurements of type (external measurements taken from the fresh specimen by the author).—Total length, 750 mm., tail vertebræ, 310; pencil, 55; ear from crown, 47; manus, including claw, 90; pes, including claw, 115; longest whisker, 113; longest hairs on dorsum, 78. Skull and teeth: condylobasal length, 108; zygomatic breadth, 73; breadth of braincase, 54; postorbital constriction, 27; interorbital constriction, 23.5; rostral breadth over canines, 26; least rostral breadth, 24.5; from posterior border of middle incisor to interpterygoid notch, 65; from last point to foramen magnum, 34; length of interpterygoid notch, 14; posterior breadth of interpterygoid notch, 11.5; distance between anterior premolars, across palate, alveoli, 20; between posterior premolars, 20.5; between posterior molars, 22.5; length of audital bulla, 18; length of mandible, 80-5; length of upper lateral tooth row, including canine, alveoli, 43; combined length of upper molars, measured on crowns, 15; upper incisor tooth row, alveoli, 14.5; lower lateral tooth row, including canine, alveoli, 49; length of lower molars, crowns, 20.

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* *Procyon hernandezii*, var. *mexicana*, St. Hilaire, Voyage de la *Venus*, Zoologie, I, 1855, 25, pl. VI (Mazatlan).

Procyon lotor californicus subsp. nov.

SOUTHWESTERN RACCOON.

Type-specimen.—Adult female, Cat. No. 60675, U. S. Nat. Mus.; collected on the ocean beach near the last Mexican Boundary monument (No. 258), San Diego County, in the southwestern corner of California, July 16, 1894, by Frank Xavier Holzner. (Original number, 1605.)

Characters.—Most closely related to *Procyon lotor psora* (Gray) from Sacramento, California, differing in its slightly smaller size and considerably paler coloration, with the overhair of underparts whitish instead of pale yellow; skull narrower, with the audital bullæ much compressed laterally.

Color (based on adult male, Cat. No. $\frac{19140}{34867}$, U. S. Nat. Mus., taken at National City, southwestern California, July 22, 1890; original number, 580; from C. K. Worthen).—Upperparts, from nape to tail, soiled grayish white, darkened by brownish-black tips to the overhairs, which are broadest and darkest in the lumbar region; nape and interscapular region faintly tinged with clay color; head with the usual blackish mask, extending backward from the naked nasal pad to the forehead, expanding across the face and sides of head, enclosing the eyes and ending in a point below the ear, with a narrow median process connecting the blackish mask with the dark crown; the mask bordered all round by a white band; lower lip white; ears white with a black band at base extending backward from the anterior base of the ear for a distance of seventy milimeters; crown brownish black considerably mixed with grayish white; underparts with overhair white and so sparse as to reveal the underfur between; upper throat warm sepia; fore limbs dirty grayish white throughout; feet and hind limbs soiled grayish white, showing the dark underfur between the long hairs, and with a brownish-black area above the heel; tail soiled grayish white, with black tip and six dark rings which are obsolete on basal portion above and scarcely discernable anywhere on the underside; underfur of back, and outer surface of limbs, fuscous, paling to benzo brown on the under side of body.

Two adult females (type and practical topotype No. $\frac{19141}{34868}$, U. S. Nat. Mus., from National City, southwestern California),[*] taken July 16 and 3, respectively, closely resemble the above-described male except that they have a slight brownish suffusion as if dirty from contact with the soil.

External measurements of type (adult female, measured fresh by the author).—Total length, 810; tail vertebræ, 312; pencil, 60; ear from crown, 60; hind foot, with claw, 112; longest whisker, 98; longest hairs on dorsum, 73.

External measurements of adult male (a well-made skin; Cat. No. $\frac{19140}{34867}$, U. S. Nat. Mus.; taken at National City, southwestern California, July 22, 1890).—Head and body, 655; tail, 290; pencil, 50; hind foot, including claw, 120; ear above crown, 29; longest whisker, 98; longest hair on dorsum, 61.[†]

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[*] The collector recorded the following external measurements on the label: Body, $23\frac{1}{4}$ inches; tail, 11; ear, $2\frac{1}{8}$.

[†] Collector's measurements from fresh specimen: Body, $21\frac{1}{2}$ inches; tail, $14\frac{1}{2}$; ear, $2\frac{1}{4}$.

Measurements of skull and teeth (adult male, Cat. No. $\frac{31867}{19110}$, U. S. Nat. Mus.; taken at National City, in the southwestern corner of California, July 22, 1890; original number, 580; from C. K. Worthen), compared with measurements of the largest adult male of *Procyon lotor psora* (Cat. No. 3933, U. S. Nat. Mus. Sacramento, California) in the collection, the latter in parentheses: Condylobasal length, 121 (120); zygomatic breadth, 83 (85); breadth of braincase, 56 (58); postorbital constriction, 25 (28); interorbital constriction, 25 (29); rostral breadth over canines, 28.5 (33), least rostral breadth, 27 (31.5); from posterior border of middle incisor to interpterygoid notch, 73 (71); from last point to foramen magnum, 38 (39); length of interpterygoid notch, 13.5 (15); posterior breadth of interpterygoid notch, 14 (15); distance between anterior premolars, across palate, 20 (22); between posterior premolars, 20 (22); between posterior molars, 22 (23); length of audital bulla, 18 (20); length of mandible, 91 (91); length of upper lateral tooth row, including canines, 43.5 (47); combined length of upper molars, crowns, 14.8 (14.5); upper incisor tooth row, alveoli, 15.5 (17); lower lateral tooth row, alveoli, 51 (52); combined length of lower molars, crowns, 19.5 (20); lower incisor tooth row, alveoli, 11 (12.5).

Measurements of skulls and teeth of two adult females (type and Cat. No. $\frac{31868}{19141}$, U. S. Nat. Mus.; National City, southwestern California; original number, 581; from C. K. Worthen), compared with measurements of the largest adult female of *Procyon lotor psora* (Cat. No. 3224, U. S. Nat. Mus.; collected at San Francisco, California, by Captain Rodgers) in the collection, the latter in parentheses: Condylobasal length, 112, 111 (112); zygomatic breadth, 75, 79 (--); breadth of braincase, 55, 53 (55); postorbital constriction, 27, 23 (28); interorbital constriction, 25, 23 (26); rostral breadth over canines, 26.5, 26.5 (28.5); least rostral breadth, 25, 25 (27); from posterior border of middle incisor to interpterygoid notch, 66, 66 (67); from last point to foramen magnum, 36.5, 36.5 (35); length of interpterygoid notch, 14.5, 15 (12); posterior breadth of interpterygoid notch, 13, 14 (15); distance between anterior premolars, across palate, alveoli, 20, 19 (19.5); between posterior premolars, 20.3, 19.3 (20); between posterior molars, 22, 20.4 (23.5); length of audital bulla, 18, 18 (19); length of mandible, 84, 90 (86); upper lateral tooth row, including canine, 42, 42.5 (43); combined length of upper molars, crowns, 14.2, 14.7 (14.5); upper incisor tooth row, alveoli, 15, 15 (16.5); lower lateral tooth row, 48.5, 49 (51); combined length of lower molars, crowns, 19, 19.7 (19.8); lower incisor tooth row, alveoli, 11.2, 11 (12).

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Vol. XXVII, pp. 69-70 March 20, 1914

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW SPECIES OF CORYMBITES FROM THE SONORAN ZONE OF WASHINGTON STATE.

(Coleoptera; Elateridæ.)

BY J. A. HYSLOP.

The following new species was reared in the course of economic wireworm investigations in the Pacific Northwest.

Corymbites noxius sp. nov.

General form moderately elongate. Color black with very obscurely brown to black legs. Moderately pilose. Head slightly deflexed, width including eyes not equal to one half width of prothorax; front flat, strongly and densely punctate, anterior margin interrupted at middle so that front is confluent with that part of the head which gives attachment to the labrum; antennae very short, not as long as the pronotum, very strongly serrate beyond third joint, third joint subconical and more slender than fourth, third longer than fourth in female, equal to fourth in male. Prothorax slightly longer than broad; sides parallel, strongly bent inward anteriorly; pronotum convex with median channel indistinct anteriorly, strongly and confluently punctate on sides, punctuations becoming smaller as they approach the disc, disc of pronotum without punctures or very finely and sparsely punctulate, very glistening, posterior angles of the pronotum divergent and strongly carinate. Prosternal sutures straight. Elytra two and one half times as long as the prothorax, sides straight and parallel, about same width as the pronotum, strongly punctate-striate, interstices slightly rounded and very obscurely punctulate. Length 10 to 13 mm.

Type locality.—Govan, Washington.

Type.—No. 18,268, U. S. National Museum.

Paratypes.—Five other specimens, three from type locality and two from Wilbur, Washington.

This species was reared from larvæ which were attacking wheat in the Big Bend Country of Washington. It falls in Horn's group IV and in Candeze's section VI. According to the latter author it falls next to *Corymbites conjungens* Lec., from which it can be easily distinguished by the confluent punctuation on the sides of the pronotum and by being entirely black except for a very slight brownish tinge on the legs.

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Vol. XXVII, pp. 71-74 April 25, 1914

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW SUBSPECIES OF MOOSE FROM WYOMING.

BY E. W. NELSON.

In has been known for many years that moose inhabit parts of the northern Rocky Mountain region in the States of Wyoming, Montana and Idaho, especially in and about the Yellowstone National Park. It is also known that they were formerly more widely distributed than at present, but their range has been restricted and their numbers diminished in most places by modern developments in their country. Their present center of abundance appears to be along the Yellowstone River and about the south end (or head) of Yellowstone Lake in the Yellowstone National Park.

We are indebted to George Shiras, 3d, for nearly all we know concerning the life history of these animals. During the late summers and autumns of 1908, 1909 and 1910 Mr. Shiras visited the head of Yellowstone Lake and ascended the Yellowstone River, and, to the surprise of every one, discovered that moose were amazingly numerous there. He saw 21 moose in the shallow water at the head of the lake at one time and estimated that there were about 1500 in this district. Owing to prohibition of shooting in the park, and the unfrequented section they occupy, they showed little alarm at the presence of Mr. Shiras and his party. In the National Geographic Magazine for July, 1913 (Vol. XXIV, No. 7), Mr. Shiras gives an account of his observations of these moose, a map of their distribution in the park and a series of fine photographs of these animals taken by day and night in their haunts. This is a remarkably interesting and valuable contribution to the life history of one of our least known big game animals. Through the generosity of Mr. Shiras and the kind cooperation of Governor Joseph M. Carey, and State Game Warden D. F. Hudson of Wyoming, a splendid pair of these animals were collected for the Biological Survey in December, 1913, the male serving as the type of the new subspecies.

In consideration of his remarkable work in originating modern methods of flash-light photography of birds and mammals and the interest he has awakened, through this and by his writings, in animal life and its preservation, I take pleasure in offering a well-deserved tribute by naming this fine game animal in honor of George Shiras, 3d.

Alces americanus shirasi subsp. nov.

SHIRAS MOOSE.

Type from Snake River, 4 miles south of Yellowstone Park, Lincoln County, Wyoming: No. 202,973, adult ♂, U. S. National Museum, Biological Survey Collection; collected December 11, 1913, by John Shive.

Distribution.—Known from the northern Rocky Mountains, in and about Yellowstone Park in Wyoming, Montana and Idaho. Probably ranges much farther north along the Rocky Mountains, but limits of range unknown.

Subspecific characters.—Differs strongly in early winter pelage from typical *Alces americanus* from Maine, Nova Scotia and New Brunswick in having the entire top of the back, including upperside of neck, rather pale rusty yellowish-brown, slightly washed on tips of hairs with dusky; ears paler and grayer; hoofs much shorter and smaller.

Description of adult male in early winter pelage (*type*).—Entire top of back and upper sides, including upper part of neck, rather pale rusty yellowish-brown, palest on neck and slightly darkened along top of back by a thin wash of dusky on tips of hairs; this dorsal rusty brown area shades into the deep black of lower parts of body along middle of sides; the black area of underparts covers all the lower half of the sides of body, the upper part of the front and hind legs and entire underside of body except a dull pale buffy area covering lower abdomen and inguinal region; middle parts of front and hind legs pale dull buffy, becoming dusky brown on lower hind legs and from knee to hoof on front legs; underside of neck mixed black and rusty brown; underside of head much blacker and much less mixed with rusty hairs than underside of neck; upper and lower lips narrowly bordered with grayish white; top and sides of muzzle and sides of head dusky brown, crown paler rusty brown; back of ears pale dull brownish gray; inside or front of ears, pale, slightly buffy whitish.

Measurements of type taken in the flesh.—Total length, 2540 mm.; length of hind foot, 762 mm.; greatest length of front hoof, 130 mm. (same measurement in adult ♂ from New Brunswick, 153 mm.).

Skull—So far as the small series of fully adult skulls available for comparison indicate there are no appreciable cranial differences between typical *A. americanus* and *A. americanus shirasi.*

Remarks.—A comparison of the type and an adult female topotype of the Shiras moose, with five adult specimens of typical *Alces americanus* collected during the same time of year in Maine and eastern Canada indicate that the pale brown backs, pale ears and small hoofs of the present form are very constant differences characterizing a strongly marked geographical form. The female topotype of the new form taken the same day as the type has an even paler brown back than the type, especially on the rump, top of shoulders and along the nape; the ears are also paler gray.

11,001

Vol. XXVII, pp. 75-76 May 11, 1914

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW BAT OF THE GENUS MIMON FROM MEXICO.

BY E. A. GOLDMAN.

Among some bats recently submitted to the Biological Survey for identification by the authorities of the Kansas University Museum of Natural History, are specimens of an apparently unnamed species of *Mimon* from Cozumel Island, Mexico. For the privilege of describing this species, the type of which has been generously donated to the Biological Survey, I am indebted to Charles D. Bunker, Assistant Curator of Birds and Mammals, Kansas University Museum of Natural History.

Mimon cozumelæ sp. nov.

Type from Cozumel Island, off the east coast of Yucatan, Mexico. No. 203,191, U. S. National Museum (Biological Survey Collection), collected by G. F. Gaumer. Skin and skull of adult.

General characters.—Similar in general to *Mimon bennettii* (Gray), but color paler, more rusty brown; skull decidedly broader.

Color.—Type: General color of upper parts near sayal brown (Ridgway, 1912), the pelage becoming paler basally; outer side of forearm clothed proximally with short fur of same color as back; under parts wood brown.

Skull.—Broader and more massive throughout than that of *M. bennettii*, the braincase conspicuously broader, zygomata more widely spreading, especially posteriorly, the sides less nearly parallel; palate broader behind posterior molars; dentition very similar, but individual teeth slightly larger.

Measurements.—Type (dry skin): Length of forearm, 58; tibia, 22.3; foot, 14.9. *Skull* (type): Greatest length, 26; zygomatic breadth, 14.3; mastoid breadth, 9.8; breadth of palate behind posterior molars, 2.8; maxillary tooth row, 9.6.

Remarks.—*Mimon bennettii* (Gray) appears in several check lists of North American mammals, including the latest,* although Alston † has shown how Dobson[*] was apparently misled into including Mexico in the recorded ranges of the species, and Elliot[†] remarks that "*Mimon bennettii*, sometimes included in the North American fauna, does not appear to be recorded north of the Isthmus of Panama." The basis for the erroneous record seems to have been the inclusion of the description of *Vampyrus auricularis*, the type of which really came from Brazil, by Saussure in his "Note sur quelques Mammifères du Mexique,"[‡] Saussure's species being later identified with *Mimon bennettii* (Gray) by Peters.[§]

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* Miller, North Amer. Land Mamm., Bull. 79, U. S. Nat. Mus., 1912, p. 37.

† Biol. Cent.—Amer., Mamm., 1879, p. 42.

Comparison with a subadult specimen from Ypanema, Sao Paulo, Brazil, which has been determined by Oldfield Thomas and is assumed to represent typical *Mimon bennettii*, seems to show that *Mimon cozumelæ* is a fairly well-marked species.

Specimens examined.—Eight, from the type locality (seven topotypes in Kansas University Museum of Natural History).

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[*] Cat. Chir. Brit. Mus., 1878, p. 492.

[†] Mamm. Middle Amer. and W. Indies, pt. II, 1904, p. 667.

[‡] Rev. et Mag. de Zool., ser. 2, XII, 1860, p. 487.

[§] Monatsb. Ak. Berlin, 1869, p. 396.

11,001

Vol. XXVII, pp. 77-80 May 11, 1914

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW ENGYSTOMATID FROG OF THE GENUS HYPOPACHUS.

BY ALEXANDER G. RUTHVEN.

Among the amphibians brought from Colombia by the Bryant Walker Expedition of the University of Michigan (1913), are 12 specimens of an Engystomatid frog that seems to be undescribed. The writer takes great pleasure in dedicating this species to Dr. A. S. Pearse, the carcinologist of the expedition, who very materially assisted in the herpetological work.

Hypopachus pearsei sp. nov.

Diagnosis.—Precoracoids very weak; sternum a cartilaginous plate, no omosternum. Diapophyses of sacral vertebrae moderately dilated. Pupil erect. Tongue elliptic, entire, free behind. No vomerine teeth; a ridge across the palate in front of the internal nares and another anterior to the œsophagus. Tympanum concealed. Head small; body large; limbs short. Total length of largest specimens, 40–47 mm. Snout pointed, on the average twice as long as the diameter of the eye. Tibio-tarsal articulation reaching the elbow when the limbs are extended along the sides. Fore-limb when extended forward reaching beyond the snout by the length of the longest toe or less than this distance. Fingers free; toes free or with slight rudiment of web. A low inner metatarsal tubercle, no outer tubercle. Skin smooth; a fold around the head behind the eyes. Color above bluish slate black or blackish slate* with a few minute white dots or very many small white spots; generally a trace of a fine median white line. Chin and throat as above or a little lighter, with very numerous white spots and a few pinkish spots. In adults the under surface of the body and limbs and the upper side of the hind feet about carrot red with irregular blackish reticulations, the dark areas frequently with small white spots. Inguinal and axillary regions and anterior and posterior faces of the thigh more or less completely suffused with carrot red; shoulder above, below, and in front of the arm insertion with large more or less confluent carrot red blotches. In a young specimen (26 mm.) the lower surface of the body and limbs blackish slate with very numerous small spots most of which are white, but a few, with the inguinal region, carrot red.

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*Color Standards and Color Nomenclature, Robert Ridgway, 1912.

Habitat.—Found in the vicinity of Fundacion, Colombia.

Type specimen.—Museum of Zoölogy, University of Michigan, Cat. No. 45,571; Fundacion, Colombia; August 13, 1913; Arthur Sperry Pearse, collector.

Description of type specimen.—Female. Total length, 40 mm.; snout, 4 mm.; diameter of eye, 2 mm. Fore-limb reaching slightly beyond the snout. The tibio-tarsal articulation just reaching the elbow when the limbs are extended along the side. Toes blunt with rudiment of web. A single, rather low, inner metatarsal tubercle, no outer tubercle; subarticular tubercles distinct. Skin smooth, a fold around the head behind the eyes. Blackish slate above with many small white spots; a trace of a fine median white line. Lower surface of body and limbs with the upper surface of the hind feet carrot red, chin and throat about deep neutral gray with numerons small white spots. Inguinal region and anterior and posterior faces of thigh carrot red, on the posterior side of the thigh interrupted by blackish reticulations. Axillary region carrot red, and shoulder with large carrot red spots above, below and in front of the arm insertion.

Remarks.—As has been pointed out to me by Dr. Leonhard Stejneger, this species is similar in form and color to the Matogrosso specimens described by Steindachner* as a color variation of *Gastrophryne* (*Engystoma*) *ovale*. Steindachner does not state that he has examined the shoulder girdle in these specimens, which are in the K. K. Naturhistorisches Hofmuseum in Vienna, but they have been dissected by Dr. F. Siebenrock, at my request, who states that the precoracoids are absent. In *Hypopachus pearsei* they are present in every specimen of the twelve examined, whereas they are absent in a typical specimen of *Gastrophryne ovale* from the same habitat.

A specimen in the U. S. National Museum (No. 14,718), catalogued as from Colombia, S. A., which Doctor Stejneger has kindly permitted me to examine, is to be referred to *H. pearsei*. It is an old specimen which has been partially dissected, and the precoracoids are broken, but pieces of the precoracoids remain and the other characters are as in the material described above.

Local distribution and habits.—*Hypopachus pearsei* was found only in the vicinity of Fundacion. About this village there are a number of marshes from which the forest has been wholly or partially cleared, and it was about these marshes that all of the specimens were secured. They were found in forms beneath logs in damp places, but in the drier parts of the swamps, generally about the margin of the cleared areas or in the surrounding forest, and seemed to avoid equally the decidedly dry habitats and the wetter parts of the marshes.

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* Verh. k. k. Zool.-bot. Ges. in Wien, 1864, p. 285, pl. XVII, figs 1, 4a.

When exposed to the light they appeared to be dazed, and as a rule only crouched closer in their forms. When further disturbed they would attempt to get under some nearby cover, which was generally the log which had been rolled off them. They rarely jumped when attempting to escape capture, their usual gait being apparently a sort of walk in which the body is pushed forward principally by the powerful hind legs. When they jump the body is not raised much above the ground.

The stomach contents of two specimens have been examined. In one there are many termites and ants, the termites predominating, a few pieces of insects other than ants, a few fragments of vegetable matter, and some small lumps of earth. The vegetable and inorganic matter was probably taken accidentally with the food. The other stomach contains ants only.

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PROCEEDINGS

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SIMULIIDÆ OF PERU.

BY FREDERICK KNAB.

Bureau of Entomology, U. S. Department of Agriculture.

In his investigation of the transmission of the disease called "verruga peruana" and the search for the insect transmitter, Prof. C. H. T. Townsend collected blood-sucking Diptera in the verruga zone. Among those submitted to the writer for determination were four species of *Simulium*, and of these three proved to be new to science. Another species still undescribed was collected by Professor Townsend in 1911 on the eastern slopes of the Andes and still another was collected in 1911 by the Yale Peruvian Expedition. Five species have been previously reported from Peru and this brings the number of species known from this country up to ten. These may be separated as follows:

1. Mesonotum black or grey, without contrasting colors 6
   Mesonotum not black and grey throughout 2
2. Mesonotum with black markings 3
   Mesonotum without black markings 4
3. Mesonotum margined with yellow and with a median reddish stripe . . . . *gaudeatum* n. sp.
   Margins yellow, disk entirely velvet black . . . . . *bicoloratum* Mall.
4. Scutum orange, paler at sides, a pair of whitish spots at anterior margin . . . . *dinellii* Joan
   Not so marked 5
5. Scutum ferruginous with four broad grey stripes . . . *escomeli* Roub.
   Scutum orange and yellow . . . . *flavipictum* n. sp.
6. Scutum with stripes on the disk 8
   Scutum without stripes on the disk 7
7. Scutellum drawn out to a sharp point; small species . . *spinifer* n. sp.
   Scutellum blunt; large species; scales on the scutum in small groups . . . . *seriatum* n. sp.

8. Small species; scutum with broad lateral iridescent areas *nitidum* Mall.
   Large species; without broad lateral iridescent areas on scutum . 9
9. Front femora and tibiæ for the most part light colored *townsendi* Mall.
   Front femora and tibiæ for the most part black . . *chalcocoma* n. sp.

Simulium gaudeatum new species.

Female.—Occiput black, with coarse black hair projecting from the nape; frons and face pale silvery grey, the frons flat, broad, nearly parallel-sided, bilobed over the antennæ. Antennæ black. Palpi black. Scutum marked with yellow, ferruginous red and velvet black; sides of the disk black, the extreme lateral margins rather broadly light yellow, a very broad light yellow zone along anterior margins and involving prothoracic lobes, divided at the middle by a broad black strip which merges with the sublateral black areas, the hind margins of yellow anterior zones concave; behind the anterior median black strip a broader stripe of ferruginous red occupying fully one-third the width of the scutum, limited at the antescutellar depression, which is also ferruginous, by a transverse wavy band of light yellow. Scutellum light yellow, with long black hairs. Dorsal vestiture of long, pale golden hairs evenly distributed, some erect very long black ones before scutellum. Postnotum blackish brown. Pleuræ blackish, grey pruinose, prothoracic portion luteous, with pale yellow hairs. Abdomen with the first segment yellow, the succeeding ones blackish with the posterior margins, particularly towards the sides, and the lateral folds yellowish. Legs variegated, all the tarsi black throughout; femora black, pale brown at bases; anterior tibiæ white with black apices; middle and posterior tibiæ brownish yellow on basal halves; in addition to the coarser black hairs there are finer pale yellow hairs on the femora and tibiæ; first joint of hind tarsi broad and long, longer than the tibia. Claws slender, with a minute tooth towards base in addition to the basal thickening. Wings clear, with red iridescent spot in the anal area; venation normal; costa, first and second veins black, subcostal vein brownish. Halteres bright yellow, the base of the stalk darkened.

Length.—Body about 2 mm.; wing, 3 mm.

Peru, two females (C. H. T. Townsend, No. 8092).

Type.—Cat. No. 18,346.

Closely related to *S. bicoloratum* Malloch, but differs particularly in the ornamentation of the scutum, as well as in other details.

Simulium dinellii (Joan).

Melusina dinellii Joan, Bol. Minist. Agric. (Buenos Aires), xiv, No. 4, pp. 363, 385 (April, 1912).

Simulium bipunctatum, Malloch, Proc. U. S. Nat. Mus., xliii, p. 650 (Dec. 31, 1912).

In establishing the synonymy for this species (Insec. Inscit. Menstr., i, 1913, p. 155) the dates of publication were inadvertently given as 1913, instead of 1912. For this reason the corrected references are here introduced.

Simulium escomeli Roubaud.

This species appears to be the commonest and most widely distributed *Simulium* in western Peru and in northern Chile. It was originally described from the neighborhood of Arequipa. Prof. Townsend has sent specimens from the following Peruvian localities: Santa Eulalia, July 5, 1913; Lima, March, 1914; Chosica, March, 1914. The National Museum has a series from northern Chile, taken by Prof. Carlos E. Porter in the Valle de Lluta and the Valle de Azapa in June, 1912. Usually the ground color of the scutum is bright ferruginous, but specimens occur in which it is rich chocolate brown. Two females, one from Lima, the other from Chosica, show this variation. This species closely resembles in coloration *S. bivittatum* from New Mexico and Colorado, but in spite of this the two are readily separable. In *S. escomeli* the scutellum is broad and blunt, while in the North American species it is narrow and drawn out to an acute angle.

Simulium flavipictum new species.

Female.—Occiput dull black, frons and face white, pruinose; frons moderately broad, widening on upper portion. Antennæ ferruginous yellow on basal half, shading from brown to dull black on distal half. Palpi blackish. Scutum ferruginous, marked with ocher yellow somewhat similarly to *S. gaudeatum*, but the markings less regular and less sharply delimited; rather broad lateral yellow stripes joining very broad yellow zones along the anterior margin, which latter are broadly divided in the middle, involve the prothoracic lobes and are deeply concave on their posterior margins; posterior margin narrowly bordered with yellow, a narrow median line extending forward to near middle of disk, a transverse yellow shade crossing it before antescutellar depression and sending forward branches at its outer angles. Scutellum yellow, broad and obtuse. Postnotum yellow, pruinose. Dorsal vestiture of coarse, evenly distributed blackish hairs with golden luster. Pleuræ yellow and ferruginous. Abdomen ferruginous yellow at base, dull blackish brown beyond first segment. Legs with the femora ferruginous yellow, the tibiæ shading to brown at their apices; anterior tarsi black, median pair with the first joint ferruginous, darker towards the tip, the second pale at base, the last three black; hind tarsi black, with bases of the first and second joints yellowish brown; vestiture of femora and tibiæ dark with golden luster. Claws slender, with a prominent tooth near base in addition to basal thickening. Wings clear, the membrane between the subcostal and first veins yellow; venation normal; costa and end of first vein brown, with black spines and hairs, the subcostal vein yellow. Halteres ferruginous yellow.

Length: Body, about 2.5 mm.; wing, 3.5 mm.

Rio Charape, Peru, 14 September, 1911, one specimen (C. H. T. Townsend).

Type.—Cat. No. 18,347, U. S. Nat. Mus.

This species is remarkable for the pigmentation of the wing-membrane of the submarginal cell, a condition which has not been observed in any other simuliid.

Simulium spinifer new species.

Female.—Frons light grey pruinose, broad above, much narrowed to a point a short distance above the antennæ, then again slightly widened; face light grey pruinose. Antennæ blunt at tip, three joints at base yellowish ferruginous, the others deep black. Scutum greyish black, evenly clothed with fine brassy hairs, two indistinct black depressed longitudinal stripes, at anterior margin a pair of large triangular pearly white spots, a whitish spot on lateral margins before roots of wings, a large subquadrate grey patch before antescutellar area, this last triangularly produced into scutellum. Prothoracic lobes dull ferruginous, with a pearly white spot at the outer angles. Scutellum triangularly produced to an acute point, obscurely ferruginous, with coarse erect black hairs on the posterior margins. Postnotum black. Pleuræ black and brown, with a large whitish pruinose patch. Abdomen dull black, the two basal segments dull brown and with long brassy hairs. Legs blackish, marked with white; tibiæ of fore legs with a whitish sheen along one side, the tarsi entirely black; middle pair with the base of the tibia and the basal two-thirds of the first tarsal joint whitish, the second and third tarsal joints pale at their bases; hind legs with the tibiæ broadly yellowish near base, the first tarsal white and with the apical fourth black, the second joint pale at base. Claws simple, produced tooth-like at the base. Wings hyaline, the venation normal; heavy veins on anterior portion of wing yellowish, the costa slightly darkened distally, the spines and hairs black; thin veins unpigmented. Halteres pale yellow, the stem dark at base.

Length: Body, about 1.3 mm.; wing, 2 mm.

Verrugas Canyon, Peru, 5 July, 1913, three females (C. H. T. Townsend).

Type.—Cat. No. 18,348, U. S. Nat. Mus.

Simulium seriatum new species.

Female.—Occiput black; frons grey pruinose, broad above, tapered regularly to the antennæ, where it is narrowed almost to a point; face grey pruinose. Antennæ with two basal joints dull ferruginous yellow, the others blackish, clothed with whitish pubescence, the tip pointed. Scutum uniformly greyish black; vestiture of lustrous, yellowish white, hair-like scales disposed in little groups which form indistinct longitudinal series. Scutellum broad, transverse, concolorous with the mesonotum, the pale scales directed transversely; posterior margin with coarse, black erect hairs. Postnotum black, pruinose. Pleuræ grey, pruinose. Abdomen black, the posterior margins of the segments narrowly pale grey.

Legs ochraceous, black and white; anterior pair with the coxæ and femora ochraceous, the tibiæ black, with white sheen on the under side on the basal two-thirds, the tarsi entirely black; middle legs with the coxæ blackish, femora and tibiæ ochraceous, the latter dark distally and with whitish luster, tarsi with the first joint white, black at tip, the second with pale basal ring, the last three all black; hind legs with the coxæ black, femora blackish brown, ochraceous at base, the tibiæ blackish, yellowish at base, the tarsi with the first joint white on the basal half, the distal half and all of the succeeding joints black. Claws long, with a short stout tooth near base in addition to the basal thickening. Wings hyaline, the venation normal; thick veins yellowish brown, the spines and dense black setæ on the costa causing it to appear nearly black; anal field with strong green and red iridescence. Halteres with brown stem and pale yellow knob.

Length.—Body, about 2.3 mm.; wing, 4.5 mm.

Santa Eulalia, Peru, July 5, 1913, and Chosica, Peru, September, 1913 (C. H. T. Townsend); two females.

Type.—Cat. No. 19,349, U. S. Nat. Mus.

Very close to *Simulium orbitale* Lutz. Differs particularly in the absence of vestiture from the frons and face and in the wedge-like narrowing of the frons towards the antennæ. In *S. orbitale*, of which an authentic specimen kindly sent by Dr. Lutz is before me, the frons is broad throughout, nearly parallel-sided.

Simulium chalcocoma new species.

Female.—Body black. Mesonotum grey-black, in certain lights velvet black on the disk and with three light grey longitudinal lines, the median line straight, narrow and anteriorly abbreviated, the others sinuate and ending in large bright spots on the anterior margin; lateral margins and anterior angles broadly grey; vestiture of coarse and rather dense, evenly distributed, brassy hairs. Scutellum deep brown, rather narrow and produced to a distinct angle. Legs rather stout, black; all three pairs of tibiæ white at bases; fore tarsi all black; middle and hind tarsi with slightly more than the basal half of the first joint white. Claws with a stout tooth in addition to basal thickening. Wings hyaline; costa black, the other thick veins brown. Halteres white.

Length.—Body, about 3 mm.; wing, 4 mm.

Tincochchoca, Peru, 7,000 feet altitude, 10 August, 1911 (Yale Peruvian Expedition).

Type.—Cat. No. 18,350, U. S. Nat. Mus.

A full description of this species will appear in a forthcoming report on the Diptera of the Yale Peruvian Expedition. It is included here for the sake of completeness.

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PROCEEDINGS
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A NEW RACE OF THE MANDARIN DUCK FROM SOUTHERN JAPAN.

BY AUSTIN H. CLARK.

A specimen of the mandarin duck from the Island of Kiusiu, Japan, and another from Shanghai, in the collection of the U. S. National Museum appear to represent a recognizable race, which may be known as

Aix galericulata brunnescens subsp. nov.

Characters.—This subspecies differs from the typical form in having the central stripe in the elongated feathers of the neck distinctly buffy instead of white; in having the black posterior border of the enlarged innermost tertial from 4 mm. to 5 mm. in width instead of from 2 mm. to 3 mm.; in having the border of the upper mandible adjacent to the sides of the face inclined anteriorly instead of being nearly perpendicular to the edges of the maxilla; and in being slightly larger.

The wing in the specimen from Kiusiu (No. 114,766 U. S. N. M.) measures 240 mm., and in the specimen from Shanghai (No. 107,150 U. S. N. M.) 235 mm.

The wing in a specimen of *Aix galericulata galericulata* from Hakodate (No. 120,679 U. S. N. M.) measures 220 mm.; in another from Sagami Bay (No. 109,463 U. S. N. M.) 220 mm.; and in a third, a tame bird (No. 168,903 U. S. N. M.), 221 mm.

Type.—No. 114,766 U. S. N. M., from Kiusiu, Japan.

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PROCEEDINGS

OF THE

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TWO NEW MURINE RODENTS FROM EASTERN ASIA.

BY GERRIT S. MILLER, JR.

[Published by permission of the Secretary of the Smithsonian Institution.]

Material in the United States National Museum collected in Manchuria and China by Mr. Arthur de C. Sowerby and Mr. W. W. Simpson includes two undescribed murine rodents.

Apodemus praetor sp. nov.

1862? [*Mus sylvaticus*] vrt. *major* RADDE, Reisen im Suden von Ost-Sibirien, vol. 1, p. 180 (Bureja Mountains, Amur). Not *Mus pumilio* var. *major* BRANTS, Muizen, p. 105. 1827.

Type.—Adult male (skin and skull) No. 197,792 U. S. National Museum. Collected on the Sungaree River, 60 miles southwest of Kirin, Kirin Province, Manchuria, July 6, 1913, by Arthur de Carle Sowerby. Original No. 625.

Diagnosis.—Like *Apodemus peninsulae* (Thomas) but size greater, ear longer, and skull more robust; ground color of upper parts slightly darker and less yellowish than in *A. peninsulae* in corresponding coat.*

Measurements.—Type and adult female (No. 197,789) from the type locality, both with teeth much worn: head and body, 115 and 110; tail, 119 and 112; hind foot, without claws, 26 and 24; ear, 16.5 and 17; condylobasal length of skull, 28.3 and 27.4; zygomatic breadth, 14.4 and 14.5; interorbital constriction, 4.7 and 4.5; breadth of braincase, 12.0 and 11.9; depth of braincase at middle, 8.5 and 8.3; nasal, 12.2 and 12.5; diastema, 9.2 and 9.0; mandible, 17.0 and 16.9; maxillary toothrow (alveoli), 4.3 and 3.7; mandibular toothrow (alveoli), 4.0 and 3.7.

Specimens examined.—Five, all from the type locality.

Remarks.—The specimens of *Apodemus praetor* have been compared with 35 skins of *A. peninsulae* from Kansu, Shensi, Shansi and Korea. In this series the two largest individuals (females), both from mountains thirty miles west of Kuei-hua-cheng, northern Shansi, measure: head and body, 100 and 101; tail, 102 and 93; hind foot, 23 and 21; ear, 15.5 and 14.

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* Four of the skins are in faded winter pelage; the fifth shows the beginning of the summer molt.

In size and general appearance the Manchurian animal resembles *Apodemus nigritalus* Hollister from the Altai Mountains. It is distinguishable, however, by longer ear and by less convex dorsal profile of skull.

Epimys norvegicus socer subsp. nov.

Type.—Adult male (skin and skull) No. 144,020, U. S. National Museum. Collected at Taocheo, Kansu, China, January 30, 1905, by W. W. Simpson. Original No. 5.

Diagnosis.—Like Manchurian specimens of *Epimys norvegicus caraco* (Pallas) but color paler, essentially as in the palest European specimens of *E. norvegicus norvegicus*, the difference between the two races about the same as that between *Mus wagneri mongolicus* and *M. wagneri manchu*.

Color.—Type: upperparts a dull buffy gray noticeably "lined" by the longer blackish hairs, the median region from crown to base of tail with a slaty tinge, the sides clearer buff (between the cream-buff and cartridge-buff of Ridgway); underparts buff like that of sides but without intermingling of dark hairs, the slaty under color appearing irregularly at surface; feet and underparts of tail light cartridge-buff, dorsal surface of tail sharply contrasted dark brown. Three immature individuals essentially like type but with slaty dorsal area broader and more diffuse.

Measurements.—Type (teeth moderately worn): head and body, 200; tail, 130; hind foot (dry), 38; hind foot without claws (dry), 36; condylobasal length of skull, 45.1; zygomatic breadth, 23.9; interorbital constriction, 6.7; breadth across postorbital angles, 11.3; least breadth across ridges at level of interparietal, 10.6; occipital breadth, 18.5; occipital depth, 11.6; nasal, 16.9; diastema, 12.5; mandible, 27.5; maxillary toothrow (alveoli), 7.7; mandibular toothrow (alveoli), 7.3.

Specimens examined.—Eight, from the following localities: Taocheo, Kansu, 4; Yu-ling-fu, Shensi, 1; twelve miles south of Yen-an-fu, Shensi, 3.

Remarks.—With the exception of one specimen, a young-adult female (teeth slightly worn) from 12 miles south of Yen-an-fu, the series is very uniform. In this individual the color is so decidedly paler that the animal appears at first glance to be a pallid example of *Epimys confucianus luticolor.* It is probably abnormal as the others from the same place show no peculiarities. Taking the seven normal specimens as a whole the Chinese race is readily distinguishable from *Epimys norvegicus caraco,* as represented by six skins from Kirin Province, Manchuria, by characters which closely parallel those distinguishing the local forms of *Mus* occurring in the same regions.

The exact agreement of some of the not fully adult Kirin specimens with Pallas's account convinces me that the Manchurian and East Siberian representative of *Epimys norvegicus* is the original "*Mus caraco*" as suggested by Thomas in 1909.* Kashtschenko has, however, recorded his opinion to the contrary and has proposed the new subspecific name

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* Ann. and Mag. Nat. Hist, ser. 8, Vol. 4, p. 502. December, 1909.

primarius for the eastern form.* Both *caraco* and *socer* are distinguishable from true *norvegicus* by less harsh fur, more hairy tail (the annulations mostly concealed, and the color of dorsal surface of tail noticeably darker than that of body), shorter hind foot, and by the smaller skull with more abruptly constricted interorbital region and more nearly parallel ridges on braincase, the least distance between these ridges at interparietals tending to be equal to or less than that between postorbital angles, while in true *norvegicus* it is usually (though not invariably) greater.

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* Ann. Mus. Zool. Acad. St. Pétersbourg, Vol. 17, (1912), p. 401. 1913.

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PROCEEDINGS

OF THE

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DESCRIPTION OF A NEW SUBSPECIES OF POGONOMYRMEX OCCIDENTALIS CRESSON FROM NEVADA.

BY FREDERICK M. GAIGE.

[Museum of Zoology, University of Michigan.]

During the summer of 1912 the Walker-Newcomb Expedition of the University of Michigan collected in northeastern Nevada a series of specimens of an ant which, although clearly allied to *Pogonomyrmex occidentalis* Cresson, differs from this long established form sufficiently to require subspecific recognition. The series comprises some hundreds of specimens which are in the Museum of Zoology, University of Michigan.

I am indebted to Prof. W. M. Wheeler, of the Bussey Institution, for examining specimens of this form and for the gift of specimens of *P. occidentalis* and *P. comanche* for comparison.

Pogonomyrmex occidentalis ruthveni* subsp. nov.

Worker.—Length, 6.5–8.5 mm.

Head rectangular, exclusive of the 7-toothed mandibles, nearly as broad as long, posterior border straight. Clypeus rather broader posteriorly with that margin usually straight or very slightly notched at its union with the frontal area, anterior border with a broad, arc-like excision, rather deeper than in typical *P. occidentalis*. Frontal area triangular, as broad as long, slightly depressed, with a very distinct median carinula. Eyes in middle of lateral surfaces of head. Antennal scapes hardly extending to midway between the eyes and the posterior corners of the head. Thorax of the usual shape with two slender epinotal spines which are longer by at least half than the distance between their bases and directed obliquely upward, outward and backward. Petiole lacking the ventral tooth, except that it may be very faintly indicated as a slight enlargement in some specimens. Postpetiole as in typical form. Gaster and legs of the usual configuration.

*Named for Dr. Alexander G. Ruthven, Director of the Museum of Zoology, University of Michigan, who was in charge of the field work in Nevada.

Mandibles shining, with rather coarse parallel striae. Frontal area distinctly shining. Clypeus, sides and upper surface of head traversed by rather coarse rugae, coarsest on cheeks. Clypeal rugae parallel, those of upper head plainly diverging posteriorly but less so than in *P. occidentalis*. Interrugal spaces densely and distinctly foveolate-punctate. Thoracic sculpture intermediate between that of *P. occidentalis* and *P. comanche*, the longitudinal rugae of the mesonotum being shorter than in the former, but very evident. Infraspinal facet of epinotum distinctly shining. Petiole and postpetiole foveolate-punctate, occasionally with faint longitudinal rugae, not shining. Gaster minutely punctate, shining; legs less shining with coxae faintly rugose, the rugae most evident on anterior, least distinct and more irregular on posterior legs.

Body and appendages beset with pale bristly hairs, which are long and project forward on anterior margin of clypeus, most abundant on dorsal surface of gaster, shortest and most appressed on antennae. Abundant oblique hairs on legs. Lower surface of head and mandibles with the usual beard of long recurved hairs. Pubescence entirely lacking.

Head, thorax and pedicel deep ferruginous red, darkest on postpetiole, gaster and legs pitchbrown to light yellowish red, mandibles piceous, mandibular teeth and anterior edge of clypeal excision black to blackish. Eyes black.

Female.—Length 10 mm.

Head, excluding the 7-toothed mandibles, very slightly longer than broad, with straight posterior border. Mandibular teeth decidedly better developed than in worker. Clypeus and frontal area as in worker. Ocelli minute. Eyes about as in worker. Antennal scape reaching to less than midway between eye and posterior corner of head. Thorax distinctly narrower than head. Epinotal spines shorter and much stouter than in worker. Ventral tooth of petiole lacking.

Sculpture of head and mandibles as in worker. Pronotum with transverse rugae, mesonotum with longitudinal rugae, much finer and more even than those of head; metanotal rugae similar but transverse; infraspinal facet of epinotum as in worker, rather more shining. Gaster and legs, particularly the former, more shining than in worker.

Pilosity generally longer and finer than in worker, otherwise the same. Color that of worker. Wings hyaline with yellow-brown veins.

Male.—Length 8 mm.

Head not broader than thorax, posterior border convex, sides subparallel. Clypeus shallower than in the preceding forms, more convex, the excision much broader and shallower. Frontal area much depressed, triangular, broader than long, with feeble median carinula. Mandibles 5-toothed, small. Eyes large, protruding beyond sides of head. Ocelli large. Antennae 13-jointed, scapes short, barely reaching to posterior border of eyes. Epinotal spines reduced to mere points, four or five times as far apart as long. Ventral tooth of petiole entirely suppressed.

Mandibles shining, finely striate. Rugae of clypeus and head fine and even, those of head parallel, not diverging posteriorly. Interrugal spaces finely but distinctly foveolate-punctate. Mesonotum still more finely rugose longitudinally, faintly shining; metanotum with even finer and more irregular transverse rugae. Petiole, post-petiole and gaster shining, the latter the most so.

Pilosity much finer than in the two preceding forms, longer and more abundant, particularly on the head, thorax and petiole. Antennal hairs erect. All hairs without bristly character.

Head and thorax piceous, appendages lighter, pedicel and gaster light yellowish red, the former the darker. Eyes dull purple. Wings as in female, but generally lighter.

Habitat.—Typical grass and sage-brush lands in Maggie Basin and the surrounding mountains in Eureka and Elko Counties, Nevada.

Type specimens.—Museum of Zoology, University of Michigan, Cat. No. 2283; James Canyon, Elko County, Nevada; August 3, 1912; Frederick M. Gaige, collector. The specimens consist of 31 cotype workers, a single aleate male and a single aleate female, all from the same colony. There are also 10 immature workers, with numerous larvae and pupae from the same nest.

Notes on paratypes.—The variations in the series examined are not great, and pertain mostly to the posterior margin of the clypeus, which is occasionally as in typical *P. occidentalis.* The ventral spine of the petiole is constantly suppressed, but in two cases approaches the development attained in the typical form. The sculpture of the head and thorax is very constant.

Remarks.—The subspecies is well defined, and as stated above is very constant throughout a considerable series. It is intermediate between the long established, widely distributed *P. occidentalis* Cresson, a very stable form described from Colorado in 1865, and *P. comanche* Wheeler first described from Texas in 1902 as a subspecies of *P. occidentalis.* The workers may readily be distinguished from those of the typical form by the absence or great reduction of the ventral tooth of the petiole, the distinctly slighter divergence posteriorly of the dorsal cephalic rugae, and the shorter longitudinal rugae of the mesonotum, and from the workers of *P. comanche* by the generally coarser sculpture, the strong carinula of the frontal area, and the longitudinal rugae of the mesonotum. In most specimens the clypeus is most like that of *P. comanche*, but it is subject to some variation as noted above.

Habits.—The habits of this subspecies are very similar to those of *P. occidentalis.* It lives in very large colonies and constructs conical mounds as high as 24 inches and sometimes 16 feet in circumference. The mounds are ordinarily covered with gravel, but an abundance of spermophile pellets is frequently found in them, although rarely to the exclusion of other materials, and along railroad tracks the black cinders are much used. The space about the nest is kept clear, often for a radius of five or six feet. The mound is usually in the centre of the clearing, and the periphery is often covered with chaff and such vegetable detritus as has been discarded by the ants. The nests have few openings, the maximum noted being six, with between two and three as an average, and they are closed with nest material at night and perhaps during storms. The ants are very active in the morning and evening, but during the hottest part of the day they are not seen unless disturbed. The nests examined were very deep, being by no means restricted to the mounds.

Large flights were noted from August 3 to 5, and during that period it was common to find isolated, dealeated females digging in the hard, dry soil to found new colonies, or to see small holes in the ground which upon being opened revealed a female at a depth of 2 inches or less, usually in a small chamber, and very rarely with a cluster of eggs, usually less than a dozen in number. Quantities of larvae and pupae and frequently eggs were commonly found in the nests opened during the summer. The young ants are very clear, light yellow, with head and thorax inclining to light brown or dull orange, dependent apparently on the age of the individual.

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WYETHIA HELIANTHOIDES NUTTALL AND WYETHIA AMPLEXICAULIS NUTTALL.

BY C. V. PIPER.

Capt. Nathaniel Wyeth in his first trip to the Pacific Northwest collected on his return journey in 1833 in the Flathead Valley, Montana, the two sunflower-like plants named in the title. On the first mentioned Nuttall founded the genus *Wyethia*, but the second he referred to the genus *Espeletia*. Six years later, however, he concluded that both were congeneric At the present time twelve species of *Wyethia* are recognized by most botanists, half of them being confined to California. All of them are confined to the region of the Rocky Mountains and westward, but one species, *W. amplexicaulis*, ranging north of the 49th parallel of latitude.

In their typical forms *Wyethia helianthoides* and *W. amplexicaulis* are very different from each other and hitherto no varieties or subspecies of either have been described. Specimens recently collected in Oregon by the veteran botanist, Mr. W. C. Cusick, show that the latter species is more variable than has been supposed and that the two species are closely interrelated by a third intermediate plant here described as a new species. The types are in the possession of the author.

The relationships of the three species and of two new subspecies are indicated in the following key:

Leaves and tegules ciliate; rays cream-colored; akenes pubescent above the middle; corona pubescent, shorter than the width of the akene.
  Upper cauline leaves petiolate . . . . *W. helianthoides* Nutt.
  Upper cauline leaves sessile . . . . *W. cusickii* n. sp.
Leaves and tegules not ciliate; rays orange-yellow; akenes glabrous; corona glabrous longer than the width of the akene.

Herbage much varnished with resin; rays 2 to 3 cm. long
W. amplexicaulis Nutt.
Herbage slightly varnished with resin.
  Leaves dark green; rays 6 to 7 cm. long
  W. amplexicaulis major n. subsp.
  Leaves pale green; rays 3 to 4 cm. long
  W. amplexicaulis subresinosa n. subsp.

Wyethia cusickii n. sp.

Whole plant slightly varnished with resin and with a sunflower-like odor, glabrous except the ciliate margins of the cauline leaves and tegules and a few hairs on the upper part of the peduncles; stems stout, 60 to 100 cm. tall, terete, rather strongly ribbed, often purple-tinged; basal leaves firm and thick, oblong lanceolate, acute or short-acuminate, 30 to 45 cm. long, on margined petioles less than half as long as the blades, the cauline sessile or subsessile, gradually reduced upwards; stems bearing a solitary terminal head, or more frequently a smaller head from the axil of each of the upper leaves; larger heads 4 cm. broad; tegules lanceolate, a few of the lowest ovate, acute, coarsely ciliate, 1.5 to 2.5 cm. long: rays about 15, pale yellow, oblong, lanceolate, acute, entire at tips or 2 or 3 toothed, 4 cm. long; bracts firm, linear, acuminate, ciliate, atomiferous-glandular near the tip; akenes pubescent toward the apex.

Found growing in swamp, Hog Valley, Blue Mountains, Union County, Oregon, together with *W. helianthoides* and *W. amplexicaulis subresinosa*, by W. C. Cusick. No. 3729 (type) June 17, 1912; No. 3730 June 17, 1912; No. 3731 June 17, 1912; No. 3748 May 29, 1913; No. 3770 July 5, 1913; No. 3782 July 5, 1913.

The specimens are intermediate between the two species with which it grew. The leaves resemble closely those of *W. amplexicaulis* except for the pubescence which is of the same general character as that of *W. helianthoides*. The akenial characters and the color of the rays are those of *W. helianthoides*. It is not unlikely that the plants may be hybrid in character. Mr. Cusick writes that its period of bloom is also intermediate, being later than that of *W. helianthoides* but earlier than *W. amplexicaulis*.

Wyethia amplexicaulis major n. subsp.

Herbage but slightly resinous; leaves thinner, often denticulate, the basal broadly oblong-lanceolate, the cauline usually (?) petiolate; rays orange-yellow, 7 cm. long; akenes glabrous.

Mormon Basin, Baker County, Oregon, alt. 4000 ft. in open dry soil, June 17, 1913, W. C. Cusick, No. 3861.

Mr. Cusick states that the more salient characters of this plant are its larger flowers, larger translucent basal leaves, and stalked cauline leaves. On the whole, however, the plant seems too closly allied to *W. amplexicaulis* to be regarded as a distinct species.

Wyethia amplexicaulis subresinosa n. subsp.

Differs from the typical plant in being much less resinous and in the foliage being pale green.

Collected by W. C. Cusick in Hog Valley, Blue Mountains, Union County, Oregon, 4000 feet alt., June 18, 1912. No. 3738.

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GENERAL NOTES.

THE STATUS OF CEBUS IMITATOR THOMAS.

A white-throated capuchin from Boquete, western Panama, was described by Mr. Oldfield Thomas[*] as *Cebus imitator*. The characters ascribed to this monkey in contrasting it with *Cebus hypoleucus* (Humboldt), from Rio Sinu, Colombia, were elongated frontal tufts, present in the female, and certain color differences which Dr. J. A. Allen[†] and Dr. D. G. Elliot[‡] have regarded as within the range of specific variation. Both authors have placed the name in synonymy. Since the publication of *C. imitator*, *C. hypoleucus* has been synonymized with *Cebus capucinus* (Linnæus), and the latter name is, therefore, currently taken to apply to an animal ranging from Colombia northward into Middle America. In studying specimens from Panama and adjoining territory, however, I find two forms differing so conspicuously from each other in dentition that they seem worthy of subspecific recognition: One, ranging from eastern Panama southward into South America and characterized by the comparative narrowness, or reduced transverse extent of the premolars, above and below; the other, inhabiting western Panama and adjacent parts of Costa Rica and distinguished by the decidedly greater width or transverse extent of these teeth.

For the proper application of names to the two closely related forms it is necessary to fix on a type region for the Linnæan species. Since *Cebus capucinus* (Linnæus) most probably came from South America, and has been identified with *C. hypoleucus* (Humboldt), of Colombia, it seems advisable to assign the typical form of the former to the type region of the latter. This disposition of the Linnæan animal leaves the name *Cebus imitator* Thomas available for the capuchin occupying western Panama. *Cebus capucinus* will therefore stand subspecifically as follows:

Cebus capucinus capucinus (Linnæus), northern Colombia.
Cebus capucinus imitator Thomas, Boquete, Panama.

—*E. A. Goldman.*

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[*] Ann. Mag. Nat. Hist., ser. 7, XI, April, 1903, p. 376.

[†] Bull. Amer. Mus. Nat. Hist., February 29, 1904, p. 80.

[‡] Review of the Primates, 1912, p. 84.

NOTES ON THE SKUNKS OF INDIANA, WITH A CORRECTION.

In my "Revision of the Skunks of the Genus Chincha" * [=*Mephitis*], I listed under the name *Chincha mesomelas avia* a specimen from Fowler, Benton County, Indiana. This specimen was in the collection of Dr. C. Hart Merriam, having been purchased from Fletcher M. Noe of Indianapolis, labeled by him with the above locality. Quite recently, this specimen with a number of other mammal skins bearing Noe's name as collector and labeled as from various places in Indiana were shown to Mr. Vernon Bailey, who instantly recognized them by the peculiar make up as having been collected by himself at Elk River, Minnesota and sold to said Noe. Associated with the skunk skin was an undoubted skull of *Mephitis mesomelas avia*, but in view of the circumstances there can be no assurance that it came from Indiana and the record above referred to should be disregarded. † The reliability of the data with any other specimens bearing Noe's name that may have found their way into collections is thus open to suspicion.

Evermann and Clark, in their "Notes on the Mammals of the Lake Maxinkuckee Region" ‡ (influenced, probably, by the supposed record from Fowler), referred the skunks of that region to *Mephitis mesomelas avia*, but specimens in the Biological Survey from Culver, later secured through the aid of Doctor Evermann, prove to be *Mephitis mephitis putida*, as are also specimens from Knox County. *Mephitis mesomelas avia* is known at present in Indiana only from a single specimen in the U. S. National Museum collected at Effner, on the Indiana-Illinois boundary.

—*Arthur H. Howell.*

NOTE ON ANAS CRISTATA GMELIN.

Count Salvadori§ says of *Anas cristata*: "This species is not a very typical member of the genus *Anas*." When a species does not conform to the diagnosis of a genus or does not fit in one without making it too elastic, I believe that it is best to remove such species, and accordingly I propose **Lophonetta** with *Anas cristata* Gmelin as the type, with the following diagnosis:

Differs from *Anas* in possessing a hair-like nuchal crest; in the middle tail-feathers being lengthened, broad, and acute, not recurved; and in having the tail composed of only 14 feathers instead of 18–20.

The two races will stand as follows:

Lophonetta cristata cristata (Gmelin).

[*Anas*] *cristata* Gmelin, Sys. Nat. i, 2, 1789, 540.

Lophonetta cristata alticola (Menegaux).

Anas cristata alticola Menegaux, Rev. Fran. Orn. I, Jan. 7, 1910, 137.

—*J. H. Riley.*

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* N. Am. Fauna, No. 20, 1901, p. 31.

† The Elk River Skunk is *Mephitis hudsonica*.

‡ Proc. Wash. Acad. Sci., XIII, 1911, p. 29.

§ Cat. Birds Br. Mus., xxvii, 1895, 217.

NOTE ON EPTESICUS PROPINQUUS.

The rare bat described by Peters in 1872 as *Vesperus propinquus* from specimens collected at Santa Ysabel, Guatemala, has since been recorded from only one additional locality, Greytown, Nicaragua. A specimen in the Field Museum of Natural History collected by Edmund Heller at Achotal, Vera Cruz, Mexico, is therefore worthy of record.

This specimen not only furnishes another and a more northern locality but also indicates that the form concerned is quite distinct from *Eptesicus fuscus* with which it is currently associated as a subspecies. Its small size, its coloration, and its cranial characters all point to this conclusion which is further strengthened by the evidence that its range is at least in part coextensive with that of *Eptesicus fuscus miradorensis*.

The specimen from Achotal, a dry skin with skull, presents a distinct type of coloration, the dark upper parts being sharply distinguished from the paler lower parts. The hairs of the upper parts are deep blackish brown basally and narrowly mummy brown apically. Those of the underparts are the same color basally but the tips are broadly russet with slightly paler somewhat olivaceous tinges. With slight allowance for an alcoholic specimen, this coloration is essentially that described by Peters as "rostroth" above and paler, more "rostgelbe" below. The external measurements of our specimen, taken by the collector, are as follows: Total length, 101; tail, 41; foot, 9.5; ear, 14; forearm, 41; tibia, 17.

A comparison of this specimen with the type of *Adelonycteris gaumeri* (Allen, Bull. Am. Mus. Nat. Hist., IX, p. 231, Sept. 28, 1897) shows no specific or subspecific differences. Santa Ysabel, the type locality of *propinquus*, is in northern Guatemala well within the basal part of the peninsula of Yucatan only a relatively short distance from Izamal, the type locality of *gaumeri*. It is evident, therefore, that *Eptesicus propinquus* is a species distinct from *E. fuscus* and that *gaumeri* is a synonym.

—*Wilfred H. Osgood.*

POOECETES GRAMINEUS CONFINIS IN LOUISIANA.

Among several vesper sparrows collected in Louisiana a number of years ago for the Biological Survey by Mr. A. H. Howell there is a single individual which, on recent careful comparison, proves to belong to the western race, *Pooecetes gramineus confinis*. This specimen is an adult male, No. 203,850, U. S. Nat. Mus., Biological Survey collection, and was taken at Natchitoches, Louisiana, on January 17, 1908. It is of considerable interest not only as the first record for Louisiana, but as the easternmost appearance of the subspecies at any season.

—*Harry C. Oberholser.*

THE EARLIEST SYSTEMATIC NAME FOR THE TUOZA OR GEORGIA POCKET GOPHER.

This is usually cited as "*Mus tuza* Ord, Guthrie's Geography, 2d Amer. ed., vol. 2, 1815, p. 292"; but Dr. Charles W. Richmond calls my attention to an earlier publication of *Mus tuza*, by Barton, in Voigt's Magazin.

The original publication should be cited as follows:

Mus tuza Barton, Voigt's Magazin der Naturkunde, vol. XII, Pt. 5, November, 1806, p. 488 (see also p. 423). The type locality is Georgia.

—*Edgar A. Mearns.*

THE STATUS OF CERTAIN AMERICAN SPECIES OF MYOTIS.

In determining some bats of the genus *Myotis* from Lower California, Mexico, I have had occasion to examine the types of several of Harrison Allen's species with the result that two from that region are found to be currently misplaced in synonymy, doubtless owing to the fact that the skulls, which most readily reveal the differential characters, had not been removed from the skins. The status of a more recently described species is also involved, as shown below. It seems desirable to publish these corrections, at this time, for the information of other workers on the general group. Discussions of the two species follow:

Myotis volans (H. Allen).

1866. *V[espertilio] volans* H. Allen, Proc. Acad. Nat. Sci. Philadelphia, p. 282. Type from Cape San Lucas, Lower California, Mexico.

1909. *Myotis capitaneus* Nelson and Goldman, Proc. Biol. Soc. Washington, XXII, p. 28, March 10, 1909. Type from San Jorge, 30 miles southwest of Comondu, Lower California, Mexico.

Myotis volans (H. Allen) proves to be a valid species which has been regarded as identical with *Myotis californicus*.* It closely resembles that species externally, but the skull is widely different, being characterized, especially, by the short rostrum and very large fully expanded braincase. Through an unfortunate oversight *Myotis capitaneus* Nelson and Goldman was published without comparison with *M. volans* of which it is clearly a synonym.

Myotis yumanensis (H. Allen).

1864. *Vespertilio yumanensis* H. Allen, Monogr. North Amer. Bats, p. 58. Cotypes from Fort Yuma, California.

1866. *V[espertilio] obscurus* H. Allen, Proc. Acad. Nat. Sci. Philadelphia, p. 281. Type from "Lower California" (taken by John Xantus probably at Cape San Lucas).

Vespertilio obscurus H. Allen, was assigned to the synonymy of *Myotis californicus* by Mr. G. S. Miller, Jr.,† the skull of the type being at the time still in the alcoholic skin. Removal of this skull and comparison with specimens of *M. yumanensis* point conclusively to identity with that species. Mr. Miller has concurred with me in the opinion that *Vespertilio obscurus* should, therefore, be transferred from the synonymy of *Myotis californicus* to that of *Myotis yumanensis*.

—*E. A. Goldman.*

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*Miller, North Amer. Fauna, No. 13, 1897, p. 69.

†North Amer. Fauna, No, 13, 1897, p. 69.

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FOUR NEW MAMMALS FROM TROPICAL AMERICA.

BY N. HOLLISTER.

[Published by permission of the Secretary of the Smithsonian Institution.]

An undescribed species of *Philander* from Middle America, a new subspecies of *Nectomys* from Paraguay, and two new monkeys of the genus *Cebus* have been found in the collection of the United States National Museum.

Philander centralis sp. nov.

Type from Talamanca, Costa Rica. Adult ♀, skin and skull; U. S. National Museum No. $\frac{12218}{38522}$. Collected by Wm. M. Gabb.

Characters.—A rich reddish-colored form, differing from *Philander laniger derbianus* (Waterhouse) of Colombia* in the much deeper shade of the red markings, the buffy (not grayish) withers mark, and the dark reddish (not grayish) hips and legs; resembles *P. l. fervidus* Thomas, from Guatemala, but is distinguished by its still richer coloration and by its almost entirely light colored tail.

Color of type.—Muzzle, cheeks, and forehead gray; median facial stripe, eye ring, postorbital stripe, and indistinct area on each side of muzzle dark brown. Upperparts of body, with exception of large buffy stripe on withers, rich hazel, brightest and most reddish on shoulders, sides, and lower back, palest on central line of rump, where there is an admixture of lighter buffy hair-tips; outer sides of legs colored uniformly with back. Arms and underparts of body cream color, the light area extending up on forward sides of body as the dark area of upperparts extends downward posteriorly. Hair of marsupium yellow ocher; naked portion of tail dark for about 20 millimeters beyond upper extension of hair, sparingly mottled slightly farther, and the remaining three-fourths light yellowish to tip.

Skull and teeth as in *P. l. derbianus*, but skull with narrower postorbital constriction.

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* See Thomas, Ann. and Mag. Nat. Hist., ser. 8, vol. 12, p. 358, October, 1913, regarding type locality of *derbianus*.

Measurements.—Skull of type and skull of a second adult ♀ from Chamelicon, Honduras, the latter in parentheses: Condylobasal length, 56 (56.8); zygomatic breadth, 33.1 (—); length of nasals, 23.1 (24.4); least postorbital constriction, 8.5 (8.7); upper tooth row, entire, 27.8 (28.2); mandible, 39.9 (41.7). The Honduras skin, measured in the flesh by the collector: Total length, 730; tail vertebræ, 435; hind foot, 48.

Specimens examined.—Three, two from the type locality and one from Chamelicon, Honduras.

Remarks.—The Honduras specimen agrees, in all details of coloration, with the type, except that while the right arm is almost entirely buffy-white, the left is heavily washed with the color of the upperparts. The extent of dark coloring at the base of tail is as in the type (much more restricted, even, than in specimens of *derbianus*) and shows no approach to *P. l. fervidus* of Guatemala.

Nectomys squamipes pollens subsp. nov.

Type from Sapucay, Paraguay. Skin and skull of adult ♂ (teeth moderately worn; basal suture not closed), U. S. National Museum No. 121,399; collected July 27, 1902, by Wm. Foster. Orig. No. 800.

Characters.—Larger than *squamipes*, *garleppii*, or *mattensis*, with considerably longer tail and larger hind foot, ear, and skull. Coloration as in *garleppii*, but cheeks and sides less yellowish, more mixed with blackish, and color of underparts more sharply marked from that of sides. Very much less reddish than true *squamipes* from the coast of Brazil; all the ochraceous or reddish colors of *squamipes* replaced by yellowish-buff, and the underparts much less intensely colored. Tail more hairy than in the related forms. Skull with well developed supraorbital beads extending backward nearly to line of posterior edge of squamosal root of zygoma; palatal foramina much constricted anteriorly; posterior edge of palate rounded, and the sides of the interpterygoid space nearly parallel.

Measurements of type compared with measurements of a slightly older adult male of *N. s. squamipes* from Sao Sebastiao, Sao Paulo, Brazil, the latter in parentheses: Head and body, 252 (194); tail, 245 (222); hind foot, without claws, 49 (45); ear from notch in dry skin, 21.8* (19). Skull and teeth: Greatest length of skull, 46 (43.5); condylobasal length, 43.4 (40.7); zygomatic breadth, 26 (23.1); nasals, 18 (17.4); least interorbital breadth, 7.7 (6.7); palatal foramina, 8.3 x 4.0 (7.4 x 3.2); mandible, 27.2 (23.5); upper molar series, 7.1 (7.0); lower molar series, 7.8 (7.3).

Remarks.—The Paraguayan form of *Nectomys squamipes* resembles *mattensis* and *garleppii* and is much like the latter in color. It is a considerably larger animal than *mattensis*, with a larger skull, and with the base of the bony palate more as in true *squamipes*. Two specimens from the type locality are in the collection.

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* Collector's measurement, ear, 25.

Cebus margaritæ sp. nov.

1896. *Cebus apella* Robinson, Proc. U. S. Nat. Mus., vol. 18, p. 651 (not of Linnæus).

1902. *Cebus fatuellus* G. M. Allen, Proc. Biol. Soc. Washington, vol. 15, p. 97 (not of Linnæus).

Type from Margarita Island, Venezuela. Skin and skull of old adult ♀, United States National Museum No. 63,219. Collected July 13, 1895, by Wirt Robinson. Orig. No. 520.

Characters.—Apparently related to *Cebus apiculatus* Elliot and *C. fatuellus* (Linn.). No whitish on forehead; tufts, entire forehead, crown, nape, whiskers, and line under chin blackish; upper arms clear warm buff on outer side to elbow; tail blackish, in sharp contrast to color of rump and hips.

Color of type.—Face thinly covered with dusky and grayish hairs; forehead from line just above eyes and including well marked tufts, crown, back of head, and nape black, with narrow brownish underfur; whiskers continuously blackish from crown around under side of throat; upper lip and chin grayish-white; area between whiskers and ear brownish-gray. Sides of neck and entire upperparts and sides of body dark brown, lightest, most tawny, anteriorly and darkest, almost Prout's brown, posteriorly, the underfur everywhere darker than hair tips; an indistinct darker, blackish-brown dorsal stripe. Underparts of body much brighter, more reddish, the hairs yellowish at bases and dark reddish-brown near tips. Arms warm buff on outer sides from shoulders to elbows, darker, more reddish-brown, on under sides; forearm and hands blackish, mixed with buff on outer side to wrist. Hips brown like back, the color extending in a mixed black and brown area to knee, and faintly to ankle; rest of legs and the feet black. Tail all black except at extreme base, where the color blends into brown of body.

Measurements of type.—Total length, 761 mm.; tail, 381; hind foot, 110. Skull: Greatest length, 86.1; condylobasal length, 68.1; zygomatic breadth, 57.9; breadth of braincase, 48.7; upper molar-premolar row, 23.1; upper tooth row, inclnding canine, 28.2; mandible, 57; mandibular molar-premolar row, 25.4.

Remarks.—The single example on which this species is based differs greatly in color from all other specimens of *Cebus* in the National Museum collection, and from the accounts of all forms I can find described in literature.

Cebus capucinus limitaneus subsp. nov.

Type from Segovia River, eastern Honduras. No. $\frac{16084}{22845}$, U. S. National Museum; skin and skull of ♂ adult. Collected in 1887 by C. H. Townsend.

Characters.—Like *Cebus capucinus imitator* Thomas of western Panama and Costa Rica,* but slightly smaller, with decidedly smaller skull.

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* See Goldman, Proc. Biol. Soc. Washington, vol. 27, p. 99, 1914.

Color of type specimen.—Forehead, sides of head and neck, throat to breast, shoulders, and upper side of arms to beyond elbow cream color, almost warm buff on shoulders and upper sides of neck; forearms, crown, neck above, tail, and entire upperparts of body and legs black. Underparts of body scantily covered with buff and dusky or blackish hairs; inner sides of legs and small area on knees grizzly.

Skull and teeth.—The skull is decidedly smaller than that of *imitator*, with smaller braincase, much smaller rostrum, and comparatively larger orbits. The teeth are relatively larger than in *imitator*, with the wide premolars which differentiate that form as well from true *capucinus*.

Measurements of type from well made dry skin.—Head and body, 430; tail, 400. Skull and teeth of type, compared with a ♂ *imitator* from Costa Rica, measurements of the latter in parentheses: Greatest length, 94 (100.4); condylobasal length, 72.2 (78.3); palatal length, 32.3 (36.1); zygomatic breadth, 64.2 (71.8); breadth of braincase, 52.7 (53.4); least postorbital breadth, 39.8 (39.1); breadth of rostrum, 28 (30.1); upper molar-premolar row, 22 (23.7); mandible, 61.7 (67.2); lower molar-premolar row, 26.4 (26.9).

Specimens examined.—Total number 13, from the following localities: British Honduras, 1 skin; Segovia River, Honduras, 4 skins and 5 skulls; Patuca, Honduras, 1 skull; Escondido River, Nicaragua, 6 skins and 4 skulls.

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OF THE

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A NEW RED-WINGED BLACKBIRD FROM THE GREAT BASIN.

BY JOSEPH GRINNELL.

[Contribution from the Museum of Vertebrate Zoology of the University of California.]

For a number of years students of birds have found difficulty in referring the red-winged blackbird of the Great Basin region of the western United States to any one of the described subspecies. Ridgway (Birds N. and Mid. Amer., part 2, 1902, page 340, footnote) includes it under the name *Agelaius phoeniceus neutralis* and remarks as follows: "Specimens from southern California and northern Lower California seem to be somewhat different from Great Basin examples, but I do not venture to separate them, the series of specimens being scarcely satisfactory." Taylor (Univ. Calif. Publ. Zool., vol. 7, 1912, page 382) treats of the Red-winged Blackbirds of Humboldt County, Nevada, under the heading: "*Agelaius phoeniceus* (subspecies indet.)."

Material has accumulated in the California Museum of Vertebrate Zoology, until there is now fair basis for a study of the situation. There seems abundant justification for naming a new race of *Agelaius phoeniceus*, and this I do as follows:

Agelaius phoeniceus nevadensis subsp. nov.

NEVADA REDWINGED BLACKBIRD

Type.—Female adult; No. 8800, Univ. Calif. Mus. Vert. Zool.; Quinn River Crossing, Humboldt County, Nevada; May 17, 1909; collected by W. P. Taylor; orig. No. 720.

Subspecific characters.—In shape of bill and other general characters closely similar to *A. p. sonoriensis;* male scarcely distinguishable, but female conspicuously darker colored, on account of the great relative breadth of black streaking both above and below; in this respect similar to female of *A. p. caurinus*, but bright rusty edgings on back and wings replaced by ashy and pale ochraceous; bill in male of *caurinus* more slender than in either *sonoriensis* or *nevadensis*.

Range.—Associationally suitable parts of the Great Basin faunal area, at least in Nevada and northeastern California. Specimens at hand as follows: *Nevada:* Humboldt County: Quinn River Crossing 22, Big Creek Ranch 2, Virgin Valley 4, Thousand Creek Flat 2; *California:* Modoc County: Goose Lake 4, Sugar Hill 1, Parker Creek 8, Alturas 11; Siskiyou County: Mayten 7; Plumas County: Meadow Valley 1; Inyo County: Lone Pine 1, Independence 17. Total, 80.

Remarks.—The new form belongs to the weak-billed category of Redwings. It is thus easily distinguished from *A. p. neutralis* of southern California. The full-width buffy bar on the wing in the male, and the conspicuously striped (not blended) coloration of the female render *nevadensis* distinct from *A. p. californicus.* (For correct assignment of characters and relationships of the latter form, see Mailliard, *Condor*, vol. 12, 1910, pages 63–70.) *A. p. caurinus* has the feeblest bill of all the western forms, and the female, although heavily streaked, has much redder edgings to the feathers dorsally than in *nevadensis.* *A. p. sonoriensis* and *A. p. nevadensis* both have pale "ground-color," but the latter has much wider black streaking both above and below. These facts recall the situation among the song sparrows occupying corresponding habitats, both faunal and associational, and suggest that similar factors bear upon these remotely related birds in such a way as to produce like results.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW BAT FROM MEXICO.

BY GLOVER M. ALLEN.

Through the kindness of Dr. James B. Rorer of the Trinidad Department of Agriculture, the Museum of Comparative Zoology has lately received a fine series of alcoholic bats of the emballonurid genus *Rhynchiscus*, collected by Mrs. Rorer on the Caroni River, in the Island of Trinidad. These excellent specimens have led me to make comparison with specimens from eastern Brazil and from the Yucatan Peninsula in the Museum collection. The type locality of Wied's *Vespertilio naso* is the east coast of Brazil, whence the species ranges northwestward into southern Mexico. At the present time, although three other species have been named (*rivalis* and *saxatilis* from Brazil, and *lineata* from Surinam), these are all currently referred as synonyms to *R. naso*. A very careful comparison between the Trinidad specimens and a series from Porto Seguro, Brazil, assumed to be typical of *naso*, fails to show any important structural character whereby the two series may be distinguished. Four specimens from Quintana Roo, southern Mexico, however, differ conspicuously from the Brazilian examples in their smaller skulls and in the form of the anterior upper premolar, which in typical *naso* is a narrow, slender, lancet-shaped tooth without a distinct cingulum cusp, whereas in the Mexican skulls this tooth in side view is broadly triangular with a distinct cingulum cusp anteriorly and posteriorly. This well-marked race I propose to recognize as

Rhynchiscus naso priscus subsp. nov.

Type.—Skin and skull No. 13,208, Museum of Comparative Zoology, from Xcopen, Quintana Roo, Mexico; collected February 18, 1912, by James Lee Peters.

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General characters.—Similar to typical *naso* of eastern Brazil, but forearm averaging very slightly smaller; skull much smaller in size; the anterior upper premolar relatively broad with conspicuous cingulum cusp anteriorly and posteriorly.

Color.—Top and sides of the head and the back a mixture of black hairs and of "mummy-brown" hairs with minute white tips, the latter becoming more conspicuous on the lower back so as to produce a broken whitish band transversely. The femora and tibiae, the free portion of the tail, and the proximal half of the interfemoral membrane clothed with rusty hairs (nearly "amber brown" of Ridgway, 1912). At the base of the forearm, internally, is a conspicuous patch of short white hair. A line of rusty hair borders the proximal third or more of the forearm externally, beyond which are some four small tufts of whitish and buff hairs at 2 or 3 mm. apart. The ventral surface of the body is dull whitish slightly washed with buffy on the belly, the hairs everywhere blackish or slaty at their bases. A small tuft of whitish hairs is present at the anterior base of each ear.

Skull and teeth.—The skull differs strikingly from that of Brazilian specimens in its smaller size and narrower rostrum, and relatively longer and narrower postorbital region. These differences though sufficiently apparent to the eye are difficult to express in millimeters in so small skulls. The anterior upper premolar is characteristic. In Brazilian specimens, representing true *naso*, this is a slender lancet-shaped tooth, its tip slightly exceeding the cingulum cusp of the canine. It is without trace of a cingulum cusp at either side in some specimens, though in others the posterior cusp is faintly indicated. The tooth is separated from the canine by a space about equal to its own diameter, and from the posterior premolar by about twice that distance. In *R. n. priscus* this tooth is broad, and its crown is in lateral outline nearly an equilateral triangle, the apex of which considerably exceeds the cusp of the canine. A conspicuous cingulum cusp is present at both the anterior and the posterior ends; while so broad is the tooth that it is nearly in contact with the canine.

Measurements.—The forearm of the type measures 38.5 mm. In the four specimens from the type locality this dimension averages 38.0 mm. (37.2–39). In the Brazilian specimens it is very slightly more and averages 39.8 in five specimens (38.5–41). The following measurements are from an alcoholic topotype (14,637) and those in parentheses are from a specimen from Porto Seguro, Brazil, representing true *naso:* end of snout to tip of tail, 53 (58); tail, 13 (13.5); tibia, 14.5 (14.5); hind foot with claws, 7.4 (7.3); calcaneum, 19.5 (19.5); forearm, 38.2 (39); second metacarpal, 34 (34); third metacarpal, 37 (36.2); fourth metacarpal, 32 (32); fifth metacarpal, 31 (29).

Skull of the type (and of a Brazilian specimen in parentheses): greatest length, 12 (12.6); basal length, 9.9 (10.3); zygomatic width, 7.2 (7.7); mastoid width, 6.5 (6.8); interorbital constriction, 2.3 (2.7); upper tooth row (front of canine to back of last molar), 4.6 (5); lower tooth row (front of canine to back of last molar), 4.8 (5).

Remarks.—The geographical limits of this race I have not traced. Probably it is found throughout most of middle America. In his work on the families and genera of bats (Bull. U. S. Nat. Mus., No. 57, p. 88, 1907) Mr. G. S. Miller, Jr., figures a skull from the Escondido River, Nicaragua, and evidently bases his diagnosis of the genus on the specimen, since he mentions particularly the large anterior upper premolar, with its crown in outline nearly an isosceles triangle. This character, as I have shown, is found in the race *priscus*, but not in the bat of eastern South America. Probably the specimens from Quintana Roo are from nearly the northern limit of the species.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DIAGNOSIS OF A NEW SUBSPECIES OF GAMBEL'S QUAIL FROM COLORADO.*

BY EDGAR A. MEARNS.

(Published by permission of the Secretary of the Smithsonian Institution.)

The United States National Museum has recently received from Mr. J. D. Figgins the gift of four beautifully prepared specimens of this very distinct new subspecies of *Lophortyx gambelii* Gambel. The form may be distinguished as follows:

Lophortyx gambelii sanus new subspecies.

Type-specimen.—Adult male, Cat. No. 236,328, U. S. Nat. Mus. Collected at Olathe, Montrose County, Colorado, December 20, 1912, by C. S. Slocum. (Original number, 1210.)

Characters.—Size rather larger than the average of *Lophortyx gambelii gambelii* Gambel or *Lophortyx gambelii fulvipectus* (Nelson), from which forms it differs in coloration as follows: adult male with upper parts neutral gray (Ridgway, 1912), unwashed with olive; crown chestnut-brown instead of hazel; chest-patch cartridge buff instead of warm buff or chamois. Adult female with upper parts as in the male, differing from *gambelii* and *fulvipectus* in having the crown darker (sepia instead of cinnamon-drab); chin and throat darker and more grayish; chest and abdomen pale olive-buff instead of cream color.

Measurements of type.—Length of stuffed skin, 255; wing, 119; tail, 104; culmen (chord), 11; tarsus, 28.5. For detailed measurements see Figgins's paper in "The Auk," Vol. XXXI, January, 1914, pp. 62-69.

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*It is the writer's intention to prepare for publication a detailed review of the geographical forms of *Lophortyx gambelii* Gambel.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

ELEVEN NEW SPECIES AND SUBSPECIES OF POCKET GOPHERS OF THE GENUS THOMOMYS.

BY VERNON BAILEY.

The following brief diagnoses of eleven new pocket gophers are published in advance of a monograph of the genus *Thomomys*, now nearing completion. The types are all in the Biological Survey Collection in the U. S. National Museum.

Thomomys talpoides bullatus subsp. nov.

SAGE-BRUSH GOPHER.

Type from Powderville, Montana. Adult ♂, No. 55,795, U. S. Nat. Mus., Biological Survey Collection. Collected July 21, 1893, by Dr. A. K. Fisher; original number, 1402.

Characters.—Size of *talpoides*, but with larger audital bullæ, lighter dentition and brighter colors. Considerably larger than *clusius*, with less gray on cheeks. Upperparts light buffy hazel, brightest on crown, ear patch blackish; lowerparts buffy, sometimes with white on chin; feet and tail whitish.

Measurements of type.—Total length, 238; tail vertebræ, 72; hind foot, 30.

Thomomys talpoides caryi subsp. nov.

BIGHORN MOUNTAIN GOPHER.

Type from the head of Trapper Creek at 9500 feet altitude in the Bighorn Mountains, Wyoming. Adult ♀, No. 168,946, U. S. Nat. Mus., Biological Survey Collection. Collected June 10, 1910, by Merritt Cary; original number, 1993.

Characters.—Size about the same as *clusius*, or slightly smaller; skull with smaller bullæ and wider interparietal; colors slightly darker, without gray cheeks. Upperparts dull grayish brown, with plumbeous nose and blackish ear patch; lowerparts rich buffy, with white on chin and sometimes on breast; feet soiled whitish; tail gray or buffy with whitish tip.

Measurements of type.—Total length, 196; tail vertebræ, 54; hind foot, 26. More fully adult ♀ topotype, 203, 58, 28.

Thomomys talpoides nebulosus subsp. nov.

BLACK HILLS GOPHER.

Type from Sand Creek Canyon, Black Hills, Wyoming (Jack Boyden's Ranch, 5 miles above mouth of canyon, at 3750 feet altitude). Adult ♂, No. 202,495, U. S. Nat. Mus., Biological Survey Collection. Collected August 25, 1913, by Vernon Bailey; original number, 9508.

Characters.—Size of *talpoides*, skull slender, less ridged, dentition lighter, bullæ slightly more rounded. Color warm brown, much as in *fossor*. Upperparts dull walnut brown; nose plumbeous or dusky; ear patch blackish; lowerparts buffy, generally with white on chin and sometimes on breast; feet and tail whitish gray or buffy.

Measurements of type.—Total length, 230; tail vertebræ, 66; hind foot, approximately 32 (27 without claws).

Thomomys pryori sp. nov.

PRYOR MOUNTAIN GOPHER.

Type from the Pryor Mountains, Montana, at 6000 feet altitude on head of Sage Creek. Adult ♂, No. 66,469, U. S. Nat. Mus., Biological Survey Collection. Collected July 16, 1894, by Vernon Bailey; original number, 4646.

Characters.—Size of *clusius*, with low, wide skull, short nasals and projecting incisors. Color darker than that of *clusius;* upperparts dull walnut brown, about as in *fossor;* nose plumbeous; cheeks dark gray; ear patch black; lowerparts dark buff with no trace of white in topotype series; feet and tail soiled whitish or buffy.

Measurements of type.—Total length, 210; tail vertebræ, 60; hind foot, 29.

Thomomys bottae minor subsp. nov.

MENDOCINO GOPHER.

Type from Ft. Bragg, Mendocino Co., California. Adult ♂, No. 146,463, U. S. Nat. Mus., Biological Survey Collection. Collected November 30, 1905, by James H. Gaut; original number, 4187.

Characters.—Size smaller than *bottae;* skull narrower and slenderer with especially slender rostrum and deeply emarginate posterior tip of nasals. Color slightly darker than in *bottae;* upperparts dark cinnamon brown, heavily obscured with black, and in most specimens becoming almost black on nose, face, and around ears; feet white; tail grayish; lowerparts ochraceous-buff; lips and lining of cheek pouches usually white.

Measurements of type.—Total length, 226; tail vertebræ, 73; hind foot, 29.

Thomomys neglectus sp. nov.

SAN GABRIEL GOPHER.

Type from San Antonio Peak (Bear Flat Meadows at 6400 feet altitude) in the San Gabriel Mountains, California. Adult ♂, No. 137,869, U. S. Nat. Mus., Biological Survey Collection. Collected July 23, 1905, by James H. Gaut; original number, 3719.

Characters.—Size medium, skull long and narrow with almost straight dorsal outline. Color very dark with excess of clear black; upperparts dark gray produced by a heavy mixture of black-tipped hairs over dull buff; nose, face, and ear patch blackish; tail gray, feet whitish; lowerparts dull buff.

Measurements of type.—Total length, 229; tail vertebræ, 77; hind foot, 31 (32 measured dry).

Thomomys mearnsi * sp. nov.

MEARNS GOPHER.

Type from Gray's Ranch in Animas Valley, southwest corner of New Mexico. Adult ♂, No. 157,008, U. S. Nat. Mus., Biological Survey Collection. Collected August 10, 1908, by E. A. Goldman; original number, 19,939.

Characters.—Slightly smaller than *fulvus;* skull short and wide with very slender, projecting incisors, much as in *nelsoni.* Color, upperparts dull cinnamon with blackish nose and ear patches; lowerparts pale cinnamon; tail buffy gray; feet whitish.

Measurements of type.—Total length, 220; tail vertebræ, 67; hind foot, 31.

Thomomys fuscus columbianus subsp. nov.

COLUMBIA GOPHER.

Type from Touchet, Walla Walla County, Washington. Adult ♂, No. $\frac{23722}{31117}$, U. S. Nat. Mus., Biological Survey Collection. Collected September 10, 1890, by Clark P. Streator; original number, 234.

Characters.—Size much larger than *fuscus*, slightly larger than *quadratus;* skull heavier than that of *quadratus;* colors paler than either, about as in *fisheri.* Upperparts light fawn color or buffy gray; sides and belly pale buffy gray; ear and postauricular patch black; nose slaty; tail gray with white tip; feet whitish.

Measurements of type.—Total length, 209; tail vertebræ, 60; hind foot, 28.

Thomomys fuscus saturatus subsp. nov.

COEUR D'ALENE GOPHER.

Type from Silver (near Saltese) in the western corner of Missoula County, Montana, at 4300 feet altitude, in the Coeur d'Alene Mountains. Adult

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* I take pleasure in naming this gopher for Dr. E. A. Mearns, who has contributed so much to our knowledge of the mammals along the northern boundary of Mexico.

♂, No. $\frac{28781}{40885}$, U. S. Nat. Mus., Biological Survey Collection. Collected June 20, 1891, by Clark P. Streator; original number, 979.

Characters.—Considerably larger than *fuscus*; skull long and high with narrow braincase and wide nasals. Color darker and richer than in *fuscus*; upperparts dark hazel, becoming more yellowish on sides, and this shading into buffy wash on lowerparts; ear patches black; nose plumbeous; feet and tail buffy gray. There is rarely a trace of white on chin or throat.

Measurements of type.—Total length, 225; tail vertebræ, 77; hind foot, 30.

Thomomys fuscus loringi subsp. nov.

ALBERTA GOPHER.

Type from South Edmonton, Alberta. Adult ♂, No. 68,746, U. S. Nat. Mus., Biological Survey Collection. Collected September 23, 1894, by J. A. Loring; original number, 2437.

Characters.—Similar to *fuscus* but slightly larger and duller colored, with relatively heavier dentition, and small, circular interparietal; ears small and pointed as in the *fuscus* group. Color in winter pelage (September 23): Upperparts dull russet brown, becoming rich buff on sides; nose slaty gray; small ear patch black; lowerparts rich buffy over plumbeous; chin and small spot on breast white; feet soiled whitish; tail pale buffy. Other pelages not known.

Measurements of type.—Total length, 199; tail vertebræ, 47; hind foot, 25.

Thomomys nevadensis atrogriseus subsp. nov.

SNAKE RIVER GOPHER.

Type from Nampa, Idaho. Adult ♂, No. 181,196, U. S. Nat. Mus., Biological Survey Collection. Collected March 15, 1913, by L. E. Wyman; original number, 35.

Characters.—About the size of *nevadensis* and also dichromatic, but darker colored in gray phase and blacker in melanistic phase. Skull relatively wider at base and with shorter, thicker pterygoids. Color in gray phase: Upperparts dark buffy gray or sooty buff; nose and face blackish; ear patch black; feet and tail dirty gray; lowerparts washed with rich buff; cheek pouches lined with black and white; chin white. Color in black phase: Dull slaty black all over except white patch on chin and white toes, and usually lower part of feet.

Measurements of type.—Total length, 315; tail vertebræ, 100; hind foot, 38.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW ACCIPITER FROM PORTO RICO WITH NOTES ON THE ALLIED FORMS OF CUBA AND SAN DOMINGO.

BY ALEX WETMORE.

A small accipiter secured in recent field work in Porto Rico proves to be a distinct form and may be known as

Accipiter striatus venator new subspecies.

Characters.—Adult male, similar to adult male of *Accipiter striatus striatus* of San Domingo but much darker above and more deeply colored below. Thighs more rufescent, black bars on upper side of tail distinct and heavily marked, brown of underparts deeper, black shaft-streaks of feathers much more heavily defined, slightly smaller. (Female not seen.)

Description.—Type, adult male, No. 238,370, U. S. National Museum (Biological Survey Collection). The Cerro Gordo, Maricao, Porto Rico; collected May 30, 1912, by Alex Wetmore; original No. 2010. Above dusky neutral gray,* darker on head, feathers with black shaft streaks, bordered indistinctly with pale neutral gray; center of belly and under tail coverts white; throat white tinged with buff, shafts heavily lined with black; breast and belly except in center white heavily barred with tawny and deep to dark mouse gray, the two colors in places intermingled in the same bar; shafts of feathers black; sides of neck, sides, flanks and thighs hazel, barred on sides, flanks and thighs more or less with white; sides of throat and auricular region cinnamon buff, shafts lined with black; primaries black barred with white underneath; bend of wing washed on inside with warm buff; feathers immediately behind cere brownish; rectrices, above mouse gray crossed by three broad black bars, slightly tipped with white; below, whitish showing 4 blackish bars, the inner one partly concealed by the under tail-coverts; the three longest upper tail-coverts indistinctly tipped with white; three of the tertials on each side with large, concealed white spots; nape with a concealed white spot. Bill black; cere blackish slate; tarsus and feet dusky green gray; inside of toes yellowish; claws black. (From dried skin.)

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* Robert Ridgway, Color Standards and Color Nomenclature (1912), January 16, 1913.

Measurements.—Male,* wing 145 mm., tail 116, tarsus 43, middle toe with claw 34, exposed culmen 16, culmen from cere 10.8.

Geographical distribution.—Porto Rico (Maricao, on western end of the island, elevation 1500 feet).

Remarks.—The single specimen upon which this description is based constitutes the only record of this genus in Porto Rico. One other bird was seen in the same locality but was not secured.

In studying this bird I have been able to bring together the following material: three specimens from San Domingo, an adult and an immature male and an adult female; and an adult and an immature male from Cuba. The birds from Cuba and San Domingo until now have been considered the same, though I do not believe that they have been critically compared before. For many years they were known collectively as *Accipiter fringilloides Vigors*, described in 1827.†

Recently Mr. J. H. Riley ‡ called attention to the fact that this was antedated by *Accipiter striatus* Vieillot § so that for four years they have borne this name. As might have been expected, on careful examination the birds from Cuba and San Domingo are found to be distinct forms so that now the following three subspecies may be recognized:

Accipiter striatus striatus Vieillot, San Domingo (Honduras, Catare, and Miranda in San Domingo; Lecoup near Port au Prince, Haiti).

Accipiter striatus fringilloides Vigors, Cuba (Guantanamo, Guama, San Diego de los Baños, Bayamo).

Accipiter striatus venator Wetmore, Porto Rico (Maricao).

The characters of these three forms may be conveniently expressed by means of the following key:

a. Deep neutral gray above; abdomen white; thighs white, faintly barred with mouse gray; no concealed white spot on inner tertials; sides of upper breast rood's brown; forehead distinctly tinged with hazel.
Accipiter striatus fringilloides.

aa. Dark or dusky neutral gray above; center of abdomen white, sides barred with brown; thighs white, heavily barred with hazel or pecan brown mixed with dark purplish gray; a large concealed white spot on three inner tertials on each side; sides of upper breast hazel; no hazel on forehead.

  b. Dark neutral gray above; upper side of tail with dark bars indistinct; black shaft marks of feathers on underside less distinct; thighs barred with pecan brown intermixed with distinct dark purplish gray.
  Accipiter striatus striatus.

  bb. Dusky neutral gray above; upper side of tail with sharply defined black bars; black shaft marks of feathers underneath strongly defined; thighs hazel barred with white.
  Accipiter striatus venator.

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* Type, no other seen.

† Zool. Journ. III, 1827, p. 434 (type from near Havana, Cuba).

‡ Proc. Biol. Soc. Washington, Vol. XXIII, p. 77.

§ Ois. Am. Sept., I, 1807, p. 42, pl. 14 (type from San Domingo).

The immature bird of *Accipiter s. striatus* examined is approximately dark mouse gray above while the immature Cuban bird is deep mouse gray. Both have a brownish wash over the ground color. The bird from San Domingo has in addition the thighs more heavily barred.

Measurements of Specimens (in millimeters).

Museum and Number.	Collector and Number.	Sex and Age.	Subspecies and Locality.	Date.	Wing.	Tail.	Exposed culmen.	Culmen from cere.	Tarsus.	M'dle toe with claw.
			A. s. striatus.							
Field Mus. 1842	Geo. K. Cherrie	male ad.	Honduras, San Dom.	April 2, 1895	157	127	17	11	46.5	30
1841	do	male juv.	Catare, San Dom.	Feb. 6, 1895	149	116	15.5	10.4	48	35
1843	do	fem. ad.	Honduras, San Dom.	April 2, 1895	181	148	19	12.8	50	46
			A. s. fringilloides.							
U.S.N.M. 110684	J. Gundlach	male ad.	Guantanamo, Cuba	Oct. 27, 1886	157	131	17	11	49.5	36.5
177450	B. S. Bowdish	male im.	Guama, Cuba	Dec. 5, 1901	156.5	130	16	10	47.5	35.5
			A. s. venator.							
U.S.N.M. 238370 *	A. Wetmore	male ad.	Maricao, Porto Rico	May 30, 1912	145	116	16	10.8	43	34

* Type.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

SUPPLEMENTARY NOTES ON PERUVIAN SIMULIIDÆ.

BY FREDERICK KNAB.

Bureau of Entomology, U. S. Department of Agriculture.

Just after the appearance of my paper on Peruvian Simuliidæ (Proc. Biol. Soc. Wash., Vol. XXVII, pp. 81-85) an additional small lot of specimens was received from Peru, recently collected by Professor Townsend. These comprise another new species and enable me to add other interesting data.

Simulium gaudeatum Knab.

The specimens described under this name were taken by Townsend in Verrugas Canyon, June 25, 1913.

Simulium seriatum Knab.

Two more females, taken at Chosica. Townsend observed that in this species the eyes are brown during life.

Simulium escomeli Roubaud.

A single female of the typical form, that is, with the mesonotum striped ferruginous yellow and pale grey, was taken by Townsend at Santa Clara, altitude 1300 feet, in April. A female, taken on the window of the hotel at Matucana on April 22, is extreme in the dark ground-color of the mesonotum. The three stripes of ground-color are velvet black in direct light, deep brown when viewed obliquely. In the typical form the mesonotum is black before the scutellum; in this specimen the antescutellar region is grey. The scutellum is pale yellowish. In other respects the specimen agrees with typical *escomeli*. It would seem that these dark variants are peculiar to the higher altitudes.

Simulium glaucophthalmum new species.

Female.—Occiput, frons and face black, grey pruinose, the frons broad, its sides rectilinear and slightly converging. Antennæ with the two basal joints ferruginous yellow, the others brown, shading to blackish towards the tip, whitish pubescent. Scutum uniformly black; vestiture of bright metallic green, hair-like scales disposed in little groups which form indistinct longitudinal series. Scutellum black, moderately broad, bluntly subtriangular, the scales like those on the mesonotum, but longer and lying transversely. Pleuræ black. Abdomen black throughout, somewhat shining, rather narrow, without marked folds. Legs slender, largely ochraceous; anterior pair with the coxa, femur and tibia yellowish, the latter infuscated towards the tip, the tarsi blackish, the first joint luteous on the basal half and dilated towards the apex; median pair with the coxa blackish, the femur, tibia and first three tarsals yellowish, the last two tarsals blackish; hind legs with the coxa black, the femur dark, broadly luteous at base, tibia yellowish white basally, blackish beyond the middle, tarsi with the first three joints yellowish, darkened along under side, the last two all dark. Claws unarmed, with obtuse basal thickening. Wings hyaline, broad, the venation normal, the thick veins yellowish; posterior iridescent spot diffused, nearly obsolete, with yellowish luster. Halteres with dark base and large creamy yellow knob. Length: body about 1.2 mm., wing 2 mm.

Santa Clara, Peru, 1300 feet, April, 1914, 2 specimens; Chosica, Peru, April, 1914, one specimen (C. H. T. Townsend).

Type.—Cat. No. 18494, U. S. Nat. Mus. (Santa Clara).

Professor Townsend has noted that in this species the eyes are green during life.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

KEY TO THE NEARCTIC GENERA AND SPECIES OF GEOCORINÆ.

(Heteroptera; Lygaeidæ.)

BY W. L. McATEE.

U. S. Biological Survey.

This paper is based largely on material contained in the U. S. National Museum, for the privilege of using which the writer is indebted to Messrs. J. C. Crawford and Otto Heidemann. Mr. W. D. Pierce also kindly submitted for examination the specimens collected by the staff of the Southern Crop Insects Investigation.

The key includes 9 species and 8 varieties, and the paper makes some reference to every form known to have been described from the Nearctic realm except *Geocoris duzeei* Montandon.

The earlier descriptions of species of Geocorinæ, like those of many other groups, often are descriptions of single specimens. As a rule, one may also say, color characters only are mentioned. It remains therefore for subsequent writers to fix the description upon some form, and to point out structural characters sufficient to properly distinguish the species.

Color is not only extremely variable, but in the Hemiptera at least depends very much on age of the individual. In using color characters it must also be remembered that albinistic or melanistic forms of any of the species may occur, and that the structural characters variable as they also are must be allowed to decide the identification. In the species of Geocorinæ represented in the United States, the color pattern of the undersurface is remarkably uniform. This is not to say that there may not be considerable variation in the details, but any of the species may have the following pale markings: spots antero-laterad of each coxa, front margin of prostethium, triangular outline or area on underside of head, and whole of legs. The coxae themselves and narrow lateral margins of abdominal segments also are commonly pale.

Because of this uniformity of lower surface, little attention is paid to that part of the body in the following pages. Unless otherwise stated, it will be understood that descriptions of form as well as color apply to the insect as viewed directly from above. The typical color pattern is most persistent on back part of head, middle of pronotum, base of scutellum and inner angle of corium. These parts should be scrutinized when there is doubt as to the ground color.

All of the species may have brachypterous forms, and these sometimes differ remarkably in appearance from the typical aspect. These short-winged specimens appear more oval and broader, this being intensified by the fact that the hemelytra usually are not overlapped so closely as in perfect-winged individuals. This condition also alters the apparent shape of the scutellum, allowing more of it to be seen. The corium of brachypterous specimens is invariably more densely and uniformly punctate than in the macropterous forms.

Finally it should be remembered that there are few hard and fast lines and that it can not be expected that a key will be simple and unerring when the group it is intended to analyze is complex and confusing.

KEY TO THE GENERA OF GEOCORINÆ OF THE WORLD.

The following key is made largely from descriptions and for that reason is undoubtedly less satisfactory than would be the case were specimens of all the groups in hand.

A. First joint of antenna longest; clavus widened posteriorly; eyes on long slender styles, directed outward and forward.
Epipolops Herrich-Schaeffer.

AA. First joint of antenna shortest; clavus not at all or only slightly widened posteriorly.

  B. Eyes somewhat pedicillate.

    C. Part of head bearing eye not at all or very little retrorsely produced, and not fitted to anterior angle of the pronotum. Tylus short, not sulcate; clavus with sides subparallel or feebly divaricate posteriorly. Odoriferous orifices scarcely visible. *Ophthalmocoris* Montandon.

CC. Part of head bearing eye somewhat retrorsely produced, paralleling or almost touching anterior angle of thorax.

D. Tylus not sulcate.

E. Clavus parallel-sided, commissure distinct. *Germalus* Stal.

EE. Clavus attenuate at apex, commissure lacking. *Stenophthalmicus* Costa.*

DD. Tylus sulcate; Thorax much narrowed in front, part of head bearing eye extended laterally and constricted so that eye appears almost stalked; Bucculae small; second joint of beak subequal to first, thoracic callosities continuous or interrupted by only a few scattered punctures; scutellum notably longer than wide, almost plane, uniformly, but sparsely punctate; Clavus distinctly narrowed behind, commissure short. **Isthmocoris** new genus.

Type species: *Salda picea* Say; included species: the type, *Geocoris imperialis* Distant and *G. tristis* Stal.†

BB. Eyes not at all pedicillate. *Geocoris* Fallen.‡

KEY TO THE NEARCTIC GENERA AND SPECIES.

A. Eyes entirely laterad of point of apparent junction of head and thorax; second joint of beak not noticeably shorter than first. *Isthmocoris.*

B. Punctures on corium mostly confined to the margins, chiefly near clavus. *I. imperialis* Distant.

BB. Corium more uniformly punctate. *I. piceus* Say.

AA. Eyes not so protruding; second joint of beak noticeably shorter than first. *Geocoris.*

C. Scutellum with lateral callosities; anterior angles of pronotum evenly rounded. *G. punctipes* Say.

CC. Scutellum without lateral callosities; anterior angles of pronotum usually truncate or angulately rounded.

D. Scutellum obviously longer than wide (sometimes subequilateral in small specimens of *G. bullatus* Say and var. *discopterus* Stal), strongly convex or in part elevated, almost always bicolor.

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* See Puton, A, et Lethierry. L. Hemipteres nouveaux de L'Algerie. Revue D'Entomologie. VI, 1887, p. 301.

† Montandon suggests (Annales Musei Nationalis Hungarici, V, 1907, p. 90) that these species should be assigned to the genus *Germalus* Stal. There are objections to this course, however. *Germalus* is described as having the bucculae distinctly elevated anteriorly, the clavus with sides parallel, and the tylus not sulcate. *Isthmocoris imperialis* and *piceus*, on the other hand, have the bucculae not more prominent than in our species of *Geocoris*, the clavus distinctly narrowed behind, and the tylus sulcate.

‡ For key to subgenera of *Geocoris*, see Stal, C., Genera Lygaeidarum Europae disposuit. Öfv. Kgl. Vet. Akad. Forh., 1872, No. 7, pp. 45–46.

E. Upper surface more depressed, pronotum less convex, sometimes sunken in the middle behind callosities; scutellum not evenly and strongly convex, either low convex with median smooth line elevated, the scutellum therefore somewhat roof-shaped, or sometimes elevated at or near base, or with a Y-shaped elevated area. Ground color more grayish.
G. bullatus Say.

EE. Upper surface more convex; pronotum rounded, sometimes sub-depressed; scutellum very convex, evenly rounded, median line usually scarcely elevated, or elevated Y-shaped area sometimes present. Ground color more yellowish. *G. decoratus* Uhler.

DD. Scutellum about equilateral (subequilateral in *G. atricolor* Montandon), smoothly low convex, or almost plane; almost always unicolor.

F. Head almost smooth, with a sharply impressed line running from near apex of tylus well up on vertex.
G. scudderi Stal.

FF. Head granular, impressed line when present, broader, less distinct and interrupted at base of tylus.

G. Median smooth line of pronotum well defined, percurrent or nearly so, and slightly carinate.
G. carinatus new species.

GG. Median smooth line of pronotum poorly defined, usually incomplete and not at all carinate.

H. Form more oblong, pronotum more elongate, scutellum narrower; piceous with a steely bluish glint, pale margins of hemelytra usually narrow or lacking.
G. atricolor Montandon.

HH. Form more oval, pronotum more transverse, scutellum strictly equilateral; without steely bluish glint, more or less broad margins of hemelytra pale.
G. uliginosus Say.

Isthmocoris imperialis Distant.

Geocoris imperialis Distant, Biologia Centrali-Americana Rhynchota Hemiptera—Heteroptera I, pp. 197–8, 1882, Pl. xviii, fig. 18. [Duenas, Guatemala].*

Scutellum, adjacent parts of pronotum and under surface, except of head, piceous; hemelytra straw color; front and lateral margins of pronotum, head and legs chiefly yellowish; these parts and hemelytra sometimes much infuscated. Length 3.5 to 4 mm.

Specimens in the collections examined were obtained at Bayou Sara, Louisiana, San Antonio, Texas, and Los Angeles and San Bernardino, California. The species was described from Duenas, Guatemala. Mr. H. G. Barber† reported the species as new to our fauna, on the basis of a specimen collected in the vicinity of Brownsville, Texas, in 1903 or 1904. It is interesting to note, therefore, that the specimens from the first two localities cited above were collected by Mr. E. A. Schwarz in January, 1879, and December, 1878, respectively.

Isthmocoris piceus Say.

Salda picea Say, Descriptions of new species of Heteropterous Hemiptera of North America, New Harmony, Indiana, Dec., 1831, p. 18.‡ Complete writings of Thomas Say on the entomology of North America, Vol. I, 1859, p. 336. [Massachusetts.]

Scutellum, pronotum and under surface, except of head, piceous; hemelytra fuscous to piceous; head and legs chiefly yellowish. Most of the specimens examined are brachypterous, and in these the clavus and corium are fused, the claval suture being nearly or quite obsolete. Length 3.25 to 4 mm.

Specimens examined are from Andover, Massachusetts; Portland, Connecticut; New York, Pennsylvania, and Colorado.

Geocoris tristis Stal. (Nya hemiptera, Öfversigt af Kongl. [Svenska] Vetenskaps Akademiens Förhandlingar, 11, No. 8, 1854, p. 236 [California]; Hemiptera, species novas descripsit. Kongliga Svenska Fregatten Eugenies Resa. Zoology I Insecta, 1859, p. 249 [San Francisco, California]) probably is a synonym of one or the other of the above species. This question can not be definitely settled, however, without study of Stal's material. Judging from the known ranges of *piceus* and *imperialis*, the latter is most likely prove a synonym of *tristis*.

In case Stal's name is found to apply it will, under the law of priority, have precedence. This result would be but another instance among a great many in which the current name of a species is based upon non-typical specimens from an outlying part of the range. The name *tristis* would certainly be a misnomer for this the most gaily colored of our species of *Geocoris*.

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* References are given in full the first time cited, and abbreviated thereafter.

† Bull. Brooklyn Museum, Vol. I, No. 9, Oct., 1906, p. 275.

‡ Pagination of this paper according to Banks, N. Catalogue of the Nearctic Hemiptera-Heteroptera. 1910, p. 69.

Geocoris punctipes Say.

Salda bullata var. a *punctipes* Say, Heteropterous Hemiptera of North America, New Harmony, Indiana, Dec., 1831, p. 18. Complete writings, Vol. 1, 1859, p. 336. [United States.]

Ophthalmicus luniger Fieber, Die Gattung Ophthalmicus, Wiener Entomologische Monatschrift, V, 1861, p. 269. [Carolina.]

Median line of scutellum free from punctures, this smooth area usually connected with callosities, forming a polished Y-shaped area which is more or less elevated. Pronotum, scutellum (except smooth space described), and corium, near clavus, strongly punctate. Scutellar callosities, almost invaribly yellow or orange. Thoracic callosities, and most of head and scutellum, usually piceous; these may vary to straw color, except that the scutellum apparently always retains some dark color along the median line at base; most of pronotum, corium and legs usually straw to yellow, may vary to fuscous. Length 3.5 to 5 mm. Range: From New Jersey to Florida, California, Texas and Guatemala.

Geocoris punctipes variety **paulus** new variety.

A very small (3 mm.) form of this species which has only vestiges of the scutellar callosities may be known as variety *paulus*. Type in collection of U. S. National Museum.

The single specimen at hand is from Kern County, California. Were it not for the fact that the general form, especially of the pronotum, is exactly like that of *punctipes* (and that species is unique in our fauna), one would at once pronounce this specimen a representative of a new species characterized by evenly rounded anterior angles of thorax and absence of scutellar callosities. I am of the opinion however that its relationships are best expressed by calling it a variety of *punctipes*.

The size of the scutellar callosities varies considerably in *punctipes*, and in the specimen now considered, the scutellum is almost uniformly punctate, only mere traces of calloused surface being discernible. Certain specimens of *bullatus* and *decoratus* might more correctly be said to have callosities than this individual. The variety here named is not traceable by the key as it now stands.

The color is much as in a pale example of *punctipes*. Head and thoracic callosities yellow, former with a dark shade on vertex, and dark traces about tylus. Thorax and scutellum dark punctured, surface between punctures also darker near thoracic callosities and base of scutellum. General color of pronotum, scutellum and corium, testaceous; membrane hyaline. General color of undersurface fuscous, gular triangle, front margin of prostethium, coxae and coxal spots, ivory white; legs light brown.

Geocoris bullatus Say.

Salda bullata Say, Heteropterous hemiptera of North America, New Harmony, Indiana. December, 1831, p. 18. Complete writings, Vol. I, 1859, p. 336. [United States.]

In this species the sides of body are more arcuate on the average than in *decoratus* and the upper surface flatter. The ground color is more griseous, and opaque and there is more of a semicailoused, porcelain-like appearance to the interspaces on punctured parts of body.

The forms of *bullatus* may be distinguished as follows:

a. Averaging smaller, corium with fuscous markings only on internal angle or along posterior margin.
  b. Scutellum bicolored.
    c. Scutellum usually more densely punctate, excluding marginal rows, there are on one-half the disk, 20 or more punctures. *bullatus* var. *bullatus* Say.
    cc. Scutellum usually less densely punctate, excluding marginal rows, there are on one-half the disk, 15 or fewer punctures. *bullatus* var. *discopterus* Stal.
  bb. Scutellum entirely black. *bullatus* var. *obscuratus* Montandon.
aa. Averaging larger, corium entirely fuscous to piceous. *bullatus* var. *borealis* Dallas.

Geocoris bullatus var. **bullatus** Say. Loc. cit.

Ophthalmicus griseus Dallas, List . . . of Hemipterous Insects . . . of the British Museum, Part II, 1852, p. 585 [North America].

Ground color griseous to light yellow, head usually with much black, 3 spots on hind margin, spot at base, and three on upper surface of tylus and cheeks, and spots usually present in callosities, yellow to orange; band across pronotum in region of callosities (sometimes pronotum in general), basal region, middle line and apical part of scutellum black; membranal margin of corium fuscous or with fuscous spots. Pronotum, scutellum and clavus and marginal parts of corium copiously dark punctured, dark color sometimes reducing or obscuring the spots or vittae on scutellum and other parts of ground color usually clear.

A brachypterous specimen has the fore part of pronotum and scutellum piceous, upper surface of these and hemelytra heavily dark punctured throughout, and head, and legs light reddish brown.

Length 3.25 to 4.25 mm. Range: Maine to Minnesota, Colorado, California, Mississippi and Maryland.

Geocoris bullatus var. **discopterus** Stal.

Geocoris discopterus Stal, Enumeratio Hemipterorum, 4, Kgl. Svenska Vet. Akad. Handl. 12, No. 1, 1874, p. 136 [New Jersey].

A small, coarsely punctate, brachypterous form which intergrades with variety *bullatus*.

Large quadrate spot on head, or sometimes whole head black, in latter case, set off by a few yellow points, as ocelli, eye-margins, spots on tylus, etc.; pronotum usually piceous around callosities, general color elsewhere, two spots or vittae on scutellum, and most of corium, straw to yellow; corium usually more or less infuscate on disk. Length 2.75 to 3.25 mm. Range: From Massachusetts and New Jersey to Colorado.

Geocoris bullatus var. **obscuratus** Montandon.

Geocoris bullatus var. *obscuratus* Montandon, Especes nouvelles ou peu connues du genre Geocoris Fall. Bul. Soc. Sci. Bucarest XVI, Nos. 5–6, Sept.–Dec. 1907, p. 220 [Boulder, Colorado].

Scutellum, anterior half of pronotum, and head excepting apex of tylus black. Coloration otherwise and form as in typical variety.

Geocoris bullatus var. **borealis** Dallas.

Ophthalmicus borealis Dallas, Hemipterous Insects . . . of the British Museum. II, 1852, p. 585. [North America.]

Geocoris borealis Distant, Biologia Centrali-Americana Heteroptera I, 1882, p. 199. [Volcan de Agua, Guatemala.]

Distant says (loc. cit.): "All the Central American specimens . . . are constant in character and of the form described by Mr. Dallas, of which I have examined the type." Distant's figure (Plate 18, fig. 17) shows the corium to be chiefly fuscous, a point not mentioned in the original description, but which characterizes a giant race of *Geocoris bullatus* found in the north and in high mountains farther south. This distribution indicates that *borealis* is entitled to subspecific rank, but settling of this point may well await further accumulation of material.

The use of the term *borealis* for this race rests chiefly on Mr. Distant's action subsequent to examination of the type. The original description is very like that of *griseus* Dallas, which is placed as a synonym of *bullatus*. Should *griseus* and *borealis* prove to be the same thing, as seems likely from the original descriptions, the former has precedence.

The single specimen in the U. S. National Museum is from Ungava Bay, Labrador. Length 4.5 mm.

Geocoris decoratus Uhler.

Geocoris decoratus Uhler, Report upon the insects collected by P. R. Uhler during the explorations of 1875, including monographs of the families Cydnidae and Saldae, and the Hemiptera collected by A. S. Packard, Jr., M. D., Bul. U. S. Geol. and Geogr. Survey of the Territories, Vol. III, No. 2, 1877, pp. 410–411. [Clear Creek Canon, Colorado.]

No unequivocal structural character could be found to separate *decoratus* from *bullatus*. Everything seems to intergrade. Yet *decoratus* looked at in mass is a different thing from *bullatus*. It is longer proportionally, the scutellum always being notably longer than wide at base. The sides of the body are noticeably more nearly parallel than in *bullatus*. The ground color is more yellowish, and the surface more polished, this being especially noticeable in the hemelytra.

The varieties may be separated as follows:

a. Scutellum almost wholly black; a wedge-shaped area, consisting of scutellum and parts anterior included in a triangle with scutellum at apex, largely piceous. *decoratus* var. *decoratus* Uhler.

aa. Scutellum with obvious yellow vittae; pronotum with two longitudinal bands of dark color, one on each side of middle, these tending to disappear. *decoratus* var. *solutus* Montandon.

Geocoris decoratus var. **decoratus** Uhler.

The typical variety is strikingly colored, the piceous wedge covering head, most of pronotum and scutellum contrasting strongly with the clear margins of pronotum and the almost wholly pale hemelytra. The piceous color is sometimes much diluted on pronotum, but specimens in which the outlines of the wedge shaped marking are preserved are classed with *decoratus*. Scutellum sometimes with two yellow spots. Length 3 to 4 mm. Range: From Kansas to British Columbia, California and Texas.

Geocoris lividipennis Stal. Hemiptera Mexicana, Entomologische Zeitung (Stettin), 23, Nos. 7–9, July–Sept., 1862, p. 311. [Mexico.]

The figure of the type of this species given by Distant* represents the scutellum of *lividipennis* as being longer than wide. The species therefore belongs in the *bullatus-decoratus* group. The color characters, so far as the figure shows, pertain either to *G. decoratus* or to *G. bullatus* var. *obscuratus*. The name *lividipennis* would preoccupy either of these designations, but examination of the type is necessary before any change can intelligently be made.

Geocoris decoratus var. **solutus** Montandon.

Geocoris decoratus var. *solutus* Montandon, Bul. Soc. Sci. Bucarest, XVI, Nos. 5–6, Sept.–Dec., 1907, pp. 223–224.

When the spots on scutellum are enlarged so as to deserve the name vittae, the dark color on pronotum usually becomes broken up into two more or less definite bands, one on each side of the middle, running from posterior border to the dark band in region of callosities. The tendency to paleness is sometimes carried to such an extreme that there remain only traces of the bands in the form of dusky spots on hind margin of pronotum and ring-like traces about callosities. The base and middle line of scutellum usually retain their dark color. Length 3 to 4 mm. Range: From Kansas and Colorado to California and Texas.

Geocoris pallens Stal (Öfv. Kgl. Vet. Akad. Forh. 11, No. 8, 1854, p. 236; Kgl. Svenska Fregatten Eugenies Resa Zool. I, 1859, p. 250; Enum. Hemip. 4, Kgl. Vet. Akad. Handl. Bd. 12, No. 1, 1874, p. 136 [Cali-

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* Biologia Centrali-Americana, Hemiptera-Heteroptera, I, 1882, Pl. 17, fig. 27.

fornia]) probably is the same as *G. decoratus* var. *solutus.* If this be true the name of the species will stand as *Geocoris pallens* Stal, and what is here called *G. decoratus* Uhler will have to assume a varietal name, either *lividipennis* Stal or *decoratus* Uhler according to the result of clearing up the confusion between those two names. These changes should not be made, however, unless examination of Stal's material confirms the above suggestions.

Geocoris scudderi Stal.

Geocoris scudderi Stal, Enum Hemip. 4, 1874, p. 135 [Texas].

Head as described in key, thorax distinctly narrowed in front, anterior angles almost evenly rounded, closely and strongly punctate except callosities, more or less obvious median line, and posterior angles; scutellum strongly but not densely punctate, median line smooth, slightly elevated.

Color: Eyes reddish, head, apical joint of antenna, beak and legs testaceous; other antennal joints and sometimes those of beak marked with fuscous; pronotum, scutellum and corium shining piceous, the former sometimes testaceous on hind margin; narrow reflexed edge of corium somewhat lighter in color; membrane clear light brown. Length 3.3 mm. Two males, Victoria, Texas, May 15, 1908, on herbage.

Geocoris carinatus new species.

Scutellum equilateral, smoothly low convex, closely and evenly punctured, except for a slightly elevated smooth line traversing posterior two-thirds; head granular with median sulcus interrupted by a knob at base of tylus, sulcus faint above this point; pronotum very transverse, slightly narrowed in front, anterior angles almost evenly rounded, median smooth line practically percurrent, well defined and slightly elevated; pronotum closely dark punctured except posterior angles, corium with two rows of closely set punctures near clavus, and one near costal margin, posterior third of corium sparsely punctate, even on disk; form broadest at eyes, thorax broad, sides of hemelytra converging rapidly, the insect thus having a particularly big headed, broad-shouldered aspect.

Head piceous, tylus and spot about base of beak whitish, front half of pronotum piceous except testaceous spot at middle of anterior border; posterior half chiefly testaceous, a diffuse fuscous blotch on each side near hind margin; scutellum piceous, corium testaceous, infuscate near internal angle and posterior margin; membrane hyaline; underside piceous, coxal spots, ostiolar canals and front margin of prostethium whitish; legs testaceous. Length, 2.8 mm. One male, Los Angeles, California. Type in collection of U. S. National Museum.

Geocoris atricolor Montandon.

Geocoris atricolor Montandon. Bul. Soc. Sci. Bucarest XVI, Nos. 5-6, Sept.-Dec. 1907, pp. 228-229 [Utah, Colorado, Texas].

Shining piceous, usually with a steely bluish cast; coxae, ends of femora, more or less of distal parts of tibiae and tarsi, light brown; hemelytra usually with no more than a trace of fuscous edging, but sometimes with broad testaceous margins, being fuscous only on disk. Length 3.5 to 4 mm. Range: Colorado to Washington and California.

May intergrade with *G. uliginosus* Say.

Geocoris uliginosus Say.

Salda uliginosa Say. Hemiptera of North America, Dec. 1831, p. 18. Complete writings, 1, 1859, p. 337 [United States].

Ophthalmicus niger Dallas, Hemipterous Insects . . . of the British Museum, II, 1852, p. 586. [North America.]

This species includes a number of color varieties which may be separated by the following key.

a. Head piceous.
  b. Pronotum piceous, sometimes with traces of lighter color along sides.
    c. Outer margins of hemelytra narrowly margined with fuscous, testaceous or white, or with narrow translucent edge. *uliginosus* var *uliginosus* Say.
    cc. Hemelytra broadly margined with white or whitish. *uliginosus* var *lateralis* Fieber.
  bb. Pronotum more or less broadly margined with testaceous or lighter color.
    Pronotum and hemelytra broadly margined with testaceous or whitish. Hemelytra sometimes entirely pale. *uliginosus* var. *speculator* Montandon.
aa. Head light reddish brown or testaceous.
  Pronotum and hemelytra broadly margined with testaceous or lighter color. Hemelytra sometimes entirely pale. *uliginosus* var *limbatus* Stal.

Geocoris uliginosus var. **uliginosus** Say. Loc. cit.

Length 3 to 4 mm. Range: From New York to Washington, California, Texas and Florida.

Geocoris uliginosus var. **lateralis** Fieber.

Ophthalmicus lateralis Fieber, Wiener Ent. Monats. V, 1861, p. 271 [Pennsylvania].

Length 3 to 4 mm. Additional to type locality: Missouri.

Geocoris uliginosus var. **speculator** Montandon.

Geocoris uliginosus var. *speculator* Montandon, Bul. Soc. Sci. Bucarest, XVI, Nos. 5–6, Sep.–Dec., 1907, pp. 227–228 [St. Louis, Mo.; Lowell, Mass.; Buffalo, N. Y.; British Columbia].

Geocoris howardi Montandon, Ibid. pp. 229–231. [Marquette, Michigan.]

Length 3.25 to 4 mm. Range: Massachusetts to British Columbia, California, and Texas.

Geocoris uliginosus var. **limbatus** Stal.

Geocoris limbatus Stal. Enum. Hemip. 4, 1874, p. 136. [New Jersey, Illinois.]

Length 3 to 4 mm. Range: Massachusetts and New York to Illinois. All specimens seen are more or less brachypterous, thus having a more oval appearance than is usual in the species.

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PROCEEDINGS
OF THE
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SYNOPSIS OF THE GENUS PROBEZZIA, WITH DESCRIPTION OF A NEW SPECIES.

(DIPTERA.)

BY J. R. MALLOCH.

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The following table includes all the described North American species of the genus *Probezzia*, and is presented with a view to assisting students of Diptera in identifying their specimens. The genus belongs to the family Chironomidæ, subfamily Ceratopogoninæ, and is distinguished from *Bezzia* by the absence of femoral spines.

1. Apex of wing brown, third vein reaching to almost nine-tenths of the wing length . . . . *terminalis* Coquillett.
   Apex of wing clear 2
2. Yellow or whitish species 3
   Thorax and generally the abdomen black, the former often covered with pale pruinescence 4
3. Pale yellow, almost white, species, only the last tarsal joint black; media sessile . . . . . *pallida*, n. sp.
   Yellow species; abdomen with brown fasciæ on the bases of dorsal and black fasciæ on apices of ventral segments; legs yellow, apices of hind femora, bases of hind tibiæ, and apices of all tibiæ and of all tarsal joints blackened; media petiolate . *elegantula* Johannsen.
4. Scutellum yellow 5
   Scutellum concolorous with disc of mesonotum 7
5. Large species, 3.75 mm.; media forks proximad of the cross vein *pachymerus* Williston.
   Smaller species, 2.5 mm. or less; media forks at or beyond the cross vein 6
6. Small species, 1 mm.; fifth tarsal joint of hind legs 3 times as long as fourth; media forks slightly beyond the cross vein *inermis* Coquillett.
   Larger species, 2 mm.; fifth tarsal joint of hind legs about twice as long as fourth; media forks at cross vein . . . *glaber* Coquillett.

7. Fifth joint of hind tarsus spinose ventrally 8
Fifth joint of hind tarsus unspined 10
8. Knob of halteres black, stalk yellow; abdomen white; legs black, the basal joint of tarsi white . . . . *albiventris* Loew.
Knob of halteres yellow or white 9
9. Eyes widely separated; legs whitish, blackened on apical half of femora, apices of hind tibiæ, and apices of all tarsal joints *elegans* Coquillett.
Eyes almost contiguous; legs black, yellow on apices of coxæ, trochanters, and bases of femora; basal 4 joints of tarsi whitish *smithi* Coquillett.
10. Mesonotum opaque, fuscous . . . . *opaca* Loew.
Mesonotum glossy black 11
11. Mesonotum with 2 whitish, pruinose vittæ . . . *bivittata* Coquillett.
Mesonotum unstriped 12
12. Abdomen yellow on basal half; legs chiefly yellow; apex of first vein not before middle of third vein . . . . . . *flavonigra* Coquillett.
Abdomen wholly black; legs chiefly black; apex of first vein distinctly before middle of third vein . . . . *gibber* Coquillett.

It will be necessary to use this table with a certain degree of caution, particularly in the character of the presence or absence of spines on the ventral surface of the last tarsal joint. I have found it to be a rule that where the female has no ventral spines on this joint they are absent in the male also; but the presence of spines on the last joint of the female tarsus is not an infallible indication of their presence in the male.

Probezzia pallida n. sp.

Female.—Whitish yellow; apical half of antennæ brownish; disc of postnotum slightly infuscated; last tarsal joint of all legs and tarsal claws black; inner side of hind tibiæ at apices with a black comb. Wings clear, veins yellow. Halteres pale yellow. Hairs on body and legs whitish.

Eyes narrowly separated; basal joint of antennæ small, globose; joints of flagellum elongated, the apical five noticeably longer than the others, the entire length of antenna one and a half times that of head and thorax combined, antennal hairs short; proboscis shorter than height of head. Mesonotum with sparse short setulose hairs arranged serially on the spaces between the areas generally occupied by the thoracic vittæ in other Chironomidæ; scutellum with scattered setulose hairs, which are not confined to the margin. Abdomen slender, its length slightly exceeding that of head and thorax combined; surface almost devoid of hairs. Legs slender; femora and tibiæ with weak hairs, those on the hind tibiæ strongest; basal joint of hind tarsus as long as the next four together, exclusive of the claws, fourth joint very short, fifth as long as 3 + 4, its ventral surface with two rows of rather long spines; tarsal claws about equal in length to fifth joint, subequal on all legs, each with a long subbasal tooth. Third vein extends almost to apex of wing; media forks proximad of the cross vein, base of lower branch subobsolete.

Length, 2.5 mm.

Type locality.—Muncie, Illinois, May 24, 1914 (C. A. Hart and J. R. Malloch). Paratypes: Monticello, Illinois, June 21, 1914 (J. R. Malloch). In collection Illinois State Laboratory of Natural History.

None of the species have been described in the immature stages, and the habits of the adults are unrecorded. The writer has taken several species by sweeping vegetation adjacent to streams at the two localities above mentioned.

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PROCEEDINGS
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DESCRIPTIONS OF FOUR NEW MAMMALS FROM TROPICAL AMERICA.

BY N. HOLLISTER.

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The following new forms of Neotropical Mammals have been found in the collection of the United States National Museum.

Ateles tricolor sp. nov.

Type from Santa Efigenia, Oaxaca, Mexico. Adult ♀, skin and skull, U. S. National Museum, No. $\frac{9427}{8972}$. Collected January 14, 1869, by F. Sumichrast. Orig. No. 42.

General characters.—Differs from *Ateles pan*, of Guatemala, in having the upper back and shoulders distinctly lighter, more brownish, than head and nape; lower back, rump, and flanks sharply yellowish-buff, not brown; tail with stripe of yellowish-buff along under side for one-third to one-half its length; throat buffy, not blackish-brown. Pelage much shorter, especially on shoulders and flanks.

Color of type-specimen.—Forehead, crown, and nape black; sides of head grayish, mixed buff and black hairs; long hairs of the forward part of back dark bister; lower back, rump, flanks, and hips yellowish-buff, almost old-gold or clay-color in the richer marked areas along upper flanks and hips; chin thinly haired with buff and black; throat and entire underparts of body pale yellowish-buff; upper arms brownish-black above, yellowish-buff below; forearms and hands black; outer side of legs dark yellowish-buff or clay-color below hips, blending through brown to clear black half way to knee; lower legs and feet black; inner sides of legs dark yellowish-buff to near heel; tail dark blackish-brown above at base, becoming clear black at tip, with a stripe of yellowish-buff along under side from root to about one-third the length.

Skull and teeth.—Skull much like that of *Ateles pan;* middle upper incisor teeth distinctly larger.

Measurements of type, from well made dry skin.—Head and body, 440; tail, 710. Skull and teeth of type (old adult ♀): Total length of skull, 109; occipitonasal length, 95.6; condylobasal length, 81.4; palatal length, 31.9; zygomatic breadth, 64.1; breadth of braincase, 54.8; maxillary molar-premolar row, 25.4; combined width middle upper incisors, 10.4; mandible, 63.4; mandibular molar-premolar row, 27.2.

Remarks.—Of late years the spider monkeys of Guatemala and southern Mexico have been combined by authors as a single variable species, under the name *vellerosus* or *pan.* The excellent series in the United States National Museum collection proves, it would seem, that they are really distinct, and certainly much less variable than has been supposed. Great confusion has arisen from the use of specimens, in European and American Museums, with imperfect data. Three fine adult specimens from Guatemala and a large series from various points in southern Mexico (including the specimens in the Biological Survey collection) have been compared, and the animals from the two regions are so different that it seems improbable that they are only geographic races of a single species. The Guatemalan *Ateles pan* is a large, long-haired, blackish monkey, distinctly of only two colors above, the head and fore parts of body black, the rump and lower back brownish. The Mexican form is distinctly tricolor above, head black, fore parts of body brown, lower back and rump sharply saddled with yellowish-buff. There are also numerous constant minor differences as described above. Doctor Elliot has shown * that all the names, with the exception of *pan*, which have been used for the spider monkeys of this region, really apply to South American forms.

Procyon lotor crassidens subsp. nov.

Type from Talamanca, Costa Rica. Adult [♂], skin and skull (basal and nasal sutures not closed), U. S. National Museum No. $\frac{12181}{14191}$. Collected by William M. Gabb. Orig. No. 14.

General characters.—Like *Procyon lotor hernandezii* of southern Mexico and Guatemala, but with decidedly larger molariform teeth.

Color of type-specimen.—Face markings sharply drawn, brownish-black and whitish. Upperparts from crown to base of tail dark blackish-gray, the coat short and harsh; underfur dull Prout's brown, hairs ringed with buff and tipped with black; a distinct narrow line of black from between ears to withers. Arms, hands, and feet buffy; legs like back and hips. Tail ringed with black and pale orange-yellow, the tip black.

Skull and teeth.—Skull essentially as in *Procyon lotor hernandezii;* the molariform teeth all decidely larger.

Measurements of type, from well made dry skin.—Head and body, 600; tail, 325; hind foot, 118. Skull: Condylobasal length, 123; palatal length, 77.1; zygomatic breadth, 75.5; nasals, greatest length, 34.5; interorbital breadth, 25.7; mastoid breadth, 65.8; mandible, 91.3. Teeth, Upper row, c–m^2, 48; pm^3–m^2, 31; pm^4–m^2, 25.1; width pm^4, 10; width m^1, 10.5; lower row, pm_1–m_2, 46.4.

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* Rev. Primates, vol. 2, pp. 21–48, 1913.

Remarks.—Specimens examined, two from Costa Rica. This form shows no approach toward the diminutive raccoon of Panama, *Procyon pumilus* Miller.

Mustela meridana sp. nov.

Type from Sierra de Merida (1630 m.) near Merida, Venezuela. Adult ♂, skin and skull (basal and nasal sutures closed), U. S. National Museum No. 123,341. Collected August 14, 1903, by S. Briceño.

General characters.—Like *Mustela affinis* of Panama and Colombia but much lighter colored, more brown, less blackish; head and nape dark brown, not pure black; underparts less intensely colored. The difference in size between the sexes is much greater than in *M. affinis;* ♂ about size of ♂ *affinis;* ♀ very much smaller than ♀ *affinis.*

Color (type specimen).—Face, sides of head to ears, and top of head to crown dark mink brown; a few white hairs in front of ears and between eyes; entire upperparts and sides of body mink brown (between Prout's brown and cinnamon-brown), considerably lighter than head; tail like back, except terminal third, which is blackish. Underparts from chin to lower belly pinkish-buff, washed with cinnamon-buff; limbs like upperparts of body, but with light color of breast extending on under side of arms to near wrist.

Skull and teeth much as in *M. affinis*, but skull of ♀ very much smaller than in that species.

Measurements of type.—Head and body, 280; tail, 170; hind foot, 50. Skull: Total length, 48.6; condylobasal length, 47.9; zygomatic breadth, 26.9; breadth of braincase, 23.1; interorbital breadth, 12.2; palatal length, 21; upper tooth row, including canine, 14.8; mandible, 26.9. Skull of ♀ from type locality compared with a ♀ of *M. affinis* from eastern Panama, measurements of the latter in parentheses: Condylobasal length, 40.7 (46.6); zygomatic breadth, 23.3 (26.8); upper tooth row, including canine, 12.0 (13.4).

Specimens examined.—Ten from the type region.

Remarks.—Compared with a series of six specimens of *Mustela affinis* from Chiriqui, Panama, Colombia, and the coast of Venezuela, the Merida specimens are all uniformly much lighter brown, without the distinctly black face, head, shoulders, and withers. They are, in general color, more like *Mustela macrura* of Peru. A single specimen from San Julian, east of La Guaira, Venezuela, is slightly browner than the specimens I refer to true *affinis*, and is without trace of white markings on the head. It may represent *Mustela affinis paraensis* (Goeldi), or a closely related form.

Loncheres flavidus sp. nov.

Type from El Valle, Margarita Island, Venezuela. Adult ♂, skin and skull, U. S. National Museum, No. 63,218. Collected July 9, 1895, by Wirt Robinson. Orig. No. 479.

General characters.—An insular form of *Loncheres punctatus* Thomas, differing from the mainland species in its more yellowish, less brownish, coloration. The ferruginous colors of *punctatus* are replaced by yellowish-buff and the sides and underparts are more buffy, less whitish.

Color of type-specimen.—General color of upperparts yellowish-buff, lined with blackish; lower back slightly brownish; head and face grayish; spines of lower back and rump tipped with white; sides of body more buffy, less streaked with darker; underparts buffy-white; hands and feet grayish.

Skull and teeth.—Skull as in *L. punctatus* but with narrower rostrum and more spatulate nasals; nasal processes of premaxillary bones extending considerably (3 mm.) beyond posterior border of nasals [in *punctatus* about even with end of nasals]; antorbital foramina smaller; posterior border of palate sharply ∧-shape; audital bullæ less rounded anteriorly, more inflated posteriorly. Teeth essentially as in *punctatus.*

Measurements of type.—Total length, 500; tail, 248; hind foot, 40.6. Skull: Palatal length, 25.7; zygomatic breadth, 27.4; median length nasals, 14.6; greatest breadth nasals, 6.7; least breadth nasals, 4.2; mastoid breadth, 20.9; least interorbital breadth, 14.6; greatest length mandible, 36. Upper tooth row, alveoli, 12.7; lower tooth row, 11.7.

Remarks.—This species is based on a single specimen, from which the tail is now missing. For the loan of specimens of *Loncheres punctatus* from the type locality, Caicara, Venezuela, I am indebted to the American Museum of Natural History, through Dr. J. A. Allen.

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Vol. XXVII, pp. 145-150 July 10, 1914

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES.

THE SYSTEMATIC NAME OF THE PACIFIC WALRUS.

The Pacific walrus is usually known as *Odobenus obesus* (Illiger, 1815) upon the strength of Illiger's *Trichechus obesus* in the Abh. Akad. Wiss. Berlin, 1804-1811 (1815) Phys. Klasse, pp. 64, 70, and 75. An examination of Illiger's paper, entitled "Ueberblick der Säugthiere nach ihrer Vertheilung über die Welttheile" shows that *Trichechus obesus* is an absolute *nomen nudum* without any trace of diagnosis, indication, or literary reference whatsoever. On page 68 of the same memoir, however, Illiger gives a perfectly tenable name to the same animal in the following sentence: "Ausser dem schon bei Europa erwähnten Wallross, *Trichechus Rosmarus*, findet sich an der westlichen Nord-Amerikanischen und nahen Ost-Asiatischen Küste, und dem Eise dieser Meere, vielleicht aber auch an der ganzen Küste des Eismeers das von Cook beschriebene und abgebildete Wallross, das ich wegen mehrerer Verschiedenheiten, besonders der Hauzähne, als eigne Art unter dem Namen *divergens* aufgeführt habe."

The reference to Cook's description and figure relates unquestionably to the "Sea Horse" of Cook's "Third Voyage."* On pp. 457-460 of vol. 2 of the original quarto edition, and on pp. 40-44 of vol. 3 of the abridged octavo edition which was published simultaneously, Capt. Cook gives an account of the walrus killed at lat. 70° 6′ N., long. 196° 42′ E. This locality, roughly, between 30 and 40 miles southwest of Icy Cape, northern Alaska, is therefore the type-locality, and the proper name of the Pacific walrus will stand as *Odobenus divergens* (Illiger).

—*Leonhard Stejneger.*

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*The title of this work is: A Voyage to the Pacific Ocean. Undertaken, by the Command of His Majesty, for making Discoveries in the Northern Hemisphere. . . . Performed under the Direction of Captains Cook, Clerke, and Gore. . . . Vol. I and II written by Captain James Cook, F. R. S. Vol. III by Captain James King, LL. D. and F. R. S. . . . London: Printed by W. and A. Straham: for G. Nicol, . . . MDCCLXXIV.

THE BREEDING PLACE OF DERMESTES ELONGATUS LECONTE.

On a recent visit to the breeding colony of the Black Crowned Night Heron near the Receiving Reservoir, D. C., in search of insects associated with these birds, Mr. R. C. Shannon found the still occupied nests swarming with Dermestid larvae. Three adults were taken, which prove to be *Dermestes elongatus* Lec. nec Hope (=? *bicolor* Fabr.), a species which appears to have been so seldom taken that the records, as far as the writer has found are best mentioned here:—

1854 LeConte described it from "Georgia, rare."
1875 Schwarz listed a specimen from Haulover, Fla.
1882 Jayne recorded it from Southern and Western States.
1894 Hamilton mentioned the distribution of this species as extensive:— New York, Canada, Kansas, Texas, Georgia, Florida. (St. Augustine *in litt.*)
1900 Casey gave Indiana as the locality of his material.
1902 Ulke recorded a specimen found under bark at Washington, D. C.
1910 Blatchley mentioned a record from near Cincinnati, but omitted Casey's Indiana record.

The unpublished records on the material in the National Collection are as follows:—

Texas:—A series of specimens collected by G. W. Belfrage in the early seventies.
Florida:—One specimen taken at Palm Beach by Dr. H. G. Dyar.
California:—One specimen beaten from a beaver skin in San Francisco, by A. Koebele about 1885.

The specific synonymy in this genus is in almost hopeless confusion and for this reason no new name is offered to supplant LeConte's homonym. Hope's name, proposed twenty years before LeConte's use of the same name, is now listed as a snyonym of *peruvianus* Cast., but Jayne was of the opinion that LeConte's species might be identical with *bicolor* Fabr., of whose habits Rosenhauer says that it often lives in the nests of pigeons where the larvae sometimes eat into the young pigeons and kill them. The larvae of some other species of the genus are known to breed in the nests of tree inhabiting caterpillars, for instance, *Dermestes tessellatus* Fabr., in the nests of the Brown tail moth, and *D. aurichalceus* Kst., in those of two other common European nest making caterpillars.

We are too apt to take the habits of the well-known, economic (and therefore conspicuous) species as applicable to the less known species of a group, more particularly so in an unattractive genus like *Dermestes*, and it is well to point out that there are probably quite diverse breeding habits even among these closely allied species. The writer believes that the normal breeding place of this species will prove to be in the nests of birds, particularly fish-eating species.

—*Herbert S. Barber.*

THE GENERIC NAMES SPEOTHOS AND ICTICYON.

In Mr. Oldfield Thomas's important paper 'On various South American Mammals' (Ann. and Mag. Nat. Hist. (8), XIII, pp. 345–363, March, 1914) he treats at some length the generic and subgeneric names of the South American Canidæ. After referring to the "extreme confusion" in which these names have "always been involved," he says: "The names *Speothos* (syn. *Icticyon*) for *venaticus* and *Chrysocyon* for *jubatus* are clearly settled, and do not need further reference" (*l. c.*, p. 351). On the next page he gives a list of the six generic names he considers valid, with their genotypes, in which *Icticyon* is omitted and *Speothos* stands: "*Speothos* . . . Bush-dogs. Type, *venaticus*." As, however, *Speothos* and *Icticyon* were both monotypic when founded, and the species referred to them were non-congeneric, it would seem that some "further reference" is necessary.

Speothos was founded by Lund in 1839.* After presenting a résumé of its differential characters he says:

"Cette espèce peut donc être séparée du reste du genre des Chiens avec le même raison qu'on a séparé les Guépards des outres Chats, pour former un petit groupe à part, groupe pour lequel je propose le nom de *Speothos*, ainsi que l'espèce fossile du Brésil, celui de *Speothos pacivorus*, d'apres l'animal dont il faisait sa principale nourriture (*Cœlogenys laticeps*)." In his accompanying list of the mammals of the Rio das Velhas drainage (*l. c.*, p. 232) *Speothos pacivorus* is No. 24. The genus *Speothos* and its single species were later † fully described and the skull figured.

Icticyon was first proposed in 1843,‡ four years after *Speothos* was founded, with *Icticyon venaticus* sp. nov. as the type and only species, and fully described and figured in 1845.§

As *Speothos* and *Icticyon* contained each only a single species when founded, *Icticyon venaticus* could not in any case be the type of *Speothos*, and until it is shown that *Speothos pacivorus* and *Icticyon venaticus* are congeneric, *Icticyon* and not *Speothos* will remain the proper generic name for the Bush-dogs, with *pacivorus* as genotype of *Speothos* and *venaticus* as genotype of *Icticyon*. —*J. A. Allen.*

LUMINOUS EARTHWORMS IN WASHINGTON, D. C.

During the month of May, 1914, one of us (H. S. B.) while spading for a garden at his residence in the northeast section of Washington, D. C., turned up several specimens of a luminous earthworm. These were quite near the surface, the earth being rather moist. Later in the month, in

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*Lund, Coup-d'œil sur les espèces éteintes de Mammifères du Brésil; extrait de quelques mémoires presentés à l'Académie royale des Sciences de Copenhague.—Ann. des Sciences naturelles, sér. 2, Vol. XI, 1839, pp. 214–234. *Speothos*, p. 224.

† Kgl. Danske Vidensk. Selsk. Nat. og Math. Afhandl., XI, 1815, pp. 55–61, pl. xix, fig. 1, 2 (skull), pl. xlv. fig. 4–9 (teeth).

‡ Oversigt Kgl. Danske Vidensk. Selsk. Forhandl. for 1842 (1843), p. 80.

§ Kgl. Danske Vidensk. Selsk. Nat. og Math. Afhandl., XI, 1845, pp. 61–72, pl. xli (animal), pl. xliii. fig. 1–5 (skull).

the presence of both of us, a few more specimens were found in the same locality, but at a depth of 8 to 12 inches below the surface, the earth then being drier. Specimens were submitted to Prof. Frank Smith, of the University of Illinois, who very kindly examined them and reported that they were, in all probability, *Microscolex phosphoreus* Dugès, a species which has been reported from Florida, North Carolina, and probably Smith's Island, Virginia. Doctor Smith states that it is nearly world wide in its distribution near coasts.

The specimens taken were 20 to 30 mm. long, and from 1 to 2 mm. in diameter. The light, as usual in luminous organisms, was greenish yellow and was evidently given off by a secretion, a luminous mucus clung to the fingers and to the earth over which the worms had crawled, the glow lasting for only a few moments. The luminous material appeared to be secreted only when the worms were disturbed, suggesting the defensive nature of the property.

We have been able to find but one reference to luminosity in American terrestrial oligochetes, this being a short paper by Prof. George F. Atkinson, in the Journal of the Elisha Mitchell Scientific Society, 1887, Vol. IV, Pt. II, who probably had the same species as that encountered by us. The possession of the luminons power by terrestrial annelids seems to be an interesting relic from their marine ancestry, as the luminosity of marine annelids is a well-known phenomenon. Walter (Trav. Soc. Nat. St. Petersbrg., C. R., 1909, Vol. 40, pp. 136–7) states that the luminosity of terrestrial oligochetes is produced by the secretion of hypodermal glands. In all there are 18 or 20 references in the literature to the production of light by earthworms.

—*F. Alex. McDermott* and *Herbert S. Barber.*

ON THE REMAINS OF AN APPARENTLY REPTILIAN CHARACTER IN THE COTINGIDÆ.

In examining the hinder aspect of the tarsus in *Carpodectes* under a 12× hand lens, the rather large oval scales will be seen to contain an apparently closed pore, reminding one of the femoral pores on certain lizards. The pores are more numerous and conspicuous on some specimens than on others, but a few are usually present. I have examined all the genera of the Cotingidæ accessible to me and find the following to possess this feature to a greater or less extent: *Porphyrolæma*, *Xipholena*, *Carpodectes*, *Lathria*, *Chirocylla*, *Tityra*, *Querula*, *Pyroderus*, *Cephalopterus*, *Calvifrons*, *Gymnoderus*, and *Chasmorhynchos.* I have not examined *Tijuca*, *Ornithion*, *Doliornis*, or *Hæmatoderus*.

Chirocylla has a most remarkable tarsus, in that on some of the scales the pits partake more of the nature of depressions and occasionally there are two such; even the scales on the sides of the tarsus and on the basal portion of the toes have such pit-like depressions or pores indicated. *Tityra*, also, is rather peculiar, as the pits are more strongly developed on the lower portion of the tarsus on the outer aspect.

I can find no mention in the standard works of reference or in the literature to the above condition of the tarsus in the Cotingidæ, though the plate of *Cephalopterus glabricollis* in Ridgway's Birds of North and Middle America, Part iv, 1907, pl. xxxiii, apparently indicates the presence of pores on the tarsus. In this genus, however, the pores are poorly developed and the majority of what are apparently pores prove on closer examination to be merely depressions. I have been unable to examine any alcoholic specimens of the above genera, but it is to be hoped that some one better qualified for the task and with ample material will investigate the subject. —*J. H. Riley.*

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

STUDIES IN TUBULIFEROUS THYSANOPTERA.

BY J. DOUGLAS HOOD.

U. S. Biological Survey.

In 1906 the order Thysanoptera embraced fewer than two hundred described species, and of these not more than forty were recorded from America. The task of revising such a small group seemed then to present few difficulties, and the completion of the work within a reasonably short time appeared certain. Now, eight years later, the number of described species is thrice as great and rapidly approaching the thousand mark; while the North American list alone has surpassed the world's total of 1906.

Notwithstanding this progress, most of the recent forms certainly await discovery and description, for Asia, Africa, Australia, and South America are virtually *terra incognita* to the Thysanopterist. Until more descriptive work has been done and the fossil species carefully studied, it will be impossible to propose a much more satisfactory generic classification of the order than the early arrangement by Uzel, based largely upon such characters as sculpture, relative proportion, and form.

The writer has thus limited his studies largely to the maintenance of a catalogue of the known Thysanoptera, and of a monograph of the American species occurring north of the Isthmus of Panama. Each will be published when it has attained a fair degree of completeness or gives promise of lasting use to students of the order. In the mean time, as in the past, new taxonomic groups will be diagnosed as rapidly as possible, and nomenclatorial questions discussed, in brief preliminary papers.

My obligations to Mr. Richard S. Bagnall, the eminent English Thysanopterist; to Mr. J. C. Faure, formerly a student in Cornell University; to Mr. James Zetek, of the Isthmian Canal Commission; and to many other friends, collectors, and collaborators, are acknowledged in detail on almost every page of this paper.

Types are in the writer's collection.

Trichothrips copiosus Uzel.

1895. *Trichothrips copiosa* Uzel, Monogr. d. Ordn. Thys., p. 252; Tab. IV, Fig. 32, Tab. VII, Fig. 138–140.

1899. *Trichothrips copiosa* Reuter, Acta Soc. pro Fauna et Flora Fennica, vol. XVII, no. 2, p. 25.

1904. *Trichothrips copiosa* Schille, Sprawozdan Komisyi fizyograficznej Akad. Umiejetnosci w Krakowie, Tom. XXXVIII, p. 17.

1907. *Trichothrips copiosa* Buffa, Atti Soc. Tosc. Sci. Nat., Mem., vol. XXIII, p. 70.

1909. *Trichothrips copiosus* Bagnall, Ent. Mo. Mag., 2d ser., vol. XX, p. 132.

1911. *Trichothrips copiosus* Bagnall, Journ. Econ. Biol., vol. VI, pt. 1, p. 11.

Since its description by Uzel from specimens taken in Bohemia and Lapland, this insect has been recorded from Finland, Poland, Hungary, Italy, and England; and now, for the first time, from the United States, where it has been taken as follows: Penikese Island, Massachusetts, December 23, 1912, and September 5, 1913, R. R. Parker, abundant under bark of Norway maple and on *Polyporus*; Bridgeport, Connecticut, August 8, 1913, H. M. Russell, 4 females and 1 male under bark of elm; Bergen Beach, Long Island, New York, January 24, 1913, R. P. Dow, 2 females and 1 male under bark of oak (Acc. 4164, American Museum of Natural History, one slide now in writer's coll.); Urbana, Illinois, March 13, 1909, James Zetek, 9 females and 5 males under bark on rotten log. All the specimens examined are apterous.

Trichothrips beachi Hinds.

1902. *Trichothrips beachi* Hinds, Proc. U. S. Nat. Mus., vol. XXVI, p. 192, Pl. VII, fig. 79, Pl. VIII, fig. 80.

The original description of this species was based upon a single macropterous female taken under quince bark in early spring, at Amherst, Massachusetts. Both sexes are well represented in the material at hand, which bears the following data: Bennings, D. C., March-April, 1913, J. D. Hood, 28 females and 3 males reared about April 17 from nymphs taken March 23 under dead willow bark; Baldwin, Michigan, August 22, 1908, J. D. H., 4 females and1 male under dead willow bark;

Mahomet, Illinois, July 27, 1908, J. D. H., 5 females under dead willow bark; Urbana, Ill., February 28, 1889, Dr. John Martin and C. A. Hart, 2 males "under boards" (Ill. State Lab. Nat. Hist., Acc. No. 14749).

All the specimens recorded above are macropterous.

A slide of three females was compared with the type of *beachi* in the collection of the Massachusetts Agricultural College by Mr. R. R. Parker, who pronounced the identification correct.

The thrips recorded by Shull from Huron County, Michigan, under the name *Trichothrips beachi* is the macropterous female of *Trichothrips americanus* Hood, as noted on page 154 of the present paper.

Trichothrips karnyi Hood.

1911. *Trichothrips karnyi* Hood, Ins. Ins. Mens., vol. II, p. 20, Pl. 1, figs. 1–3.

At the time of describing this species the writer separated from the types a large series of a closely allied but supposedly distinct form from Pennsylvania, which he intended to describe later as a new species. A more critical study of these specimens and of a large series of both sexes received from Mr. H. M. Russell shows, however, that these forms can not always be separated with certainty, though the extremes seem sufficiently different in structure and general appearance to require separate designations. The characters given in the following table, though variable, will allow the new form to be separated under the name *Trichothrips karnyi* **major** subsp. nov. (Plate 3, fig. 1).

(A. Tibiae of middle and hind legs largely blackish brown; third antennal segment darkened apically.)

(a. Head distinctly longer than broad; antennal segments 4–6 blackish brown, with pedicels abruptly pale yellow; 3 yellow, infuscate apically, distinctly paler than 4.)

b. Head produced beyond eyes, the distance from their anterior margin to the most anterior portion of frontal costa about one-sixth the width of head. Segment 1 of antenna distinctly larger in dorsal aspect than the second, its exposed portion distinctly longer than wide; segment 3 about 2.9 times as long as wide, its sense cones short and about half as long as the longest apical bristles; segment 8 about .7 times as long as 7. Tube about .85 as long as head, much darker in color at base than at apex. General color dark blackish brown, black to the naked eye. Length of living females about 3 mm.; width of prothorax about .53 mm. Nymph bright red in color, the hypodermal pigmentation practically unbroken. (Newton, Pa., Sept., 1911, H. M. Russell) . . . . . *Trichothrips karnyi major* subsp. nov.

bb. Head not noticeably produced beyond eyes, the distance from their anterior margin to the most anterior portion of frontal costa about one-eighth the width of head. Segment 1 of antenna not larger in dorsal aspect than second, its exposed portion about as wide as long; segment 3 about 2.5 times as long as wide, its sense cones long, slender, usually as long as the longest apical bristles; segment 8 about .8 as long as 7. Tube not more than .8 as long as head, as pale at base as at apex. Color light blackish brown, scarcely black to the naked eye. Length of living females about 2.1 mm.; width of prothorax about .43 mm. Nymph pink in color, the hypodermal pigmentation disposed in minute, distinct, vermilion dots. (Md., D. C., Ill.) . . . . *Trichothrips karnyi karnyi* Hood.

Trichothrips semicæcus Uzel.

1895. *Trichothrips semicaeca* Uzel, Monogr. d. Ordn. Thys., p. 249.
1909. *Trichothrips semicæcus*, Bagnall, Ent. Mo. Mag., 2d. ser., vol. XX, p. 131.

One female and two males of this species, all apterous, were found by the writer at Bennings, D. C., March 23, 1913, under dead willow bark, in company with numerous nymphs and adults of *Trichothrips beachi* Hinds. It has previously been recorded only from Bohemia (Uzel) and England (Bagnall), and is thus an addition to the American list.

Trichothrips americanus Hood.

1908. *Trichothrips americanus* Hood, Bull. Ill. State Lab. Nat. Hist., vol. VIII, art. II, p. 366, fig. 3, a–e. August 22.
1911. *Trichothrips beachi* (nec Hinds), Shull, Pub. 4, Mich. Geol. and Biol. Surv., p. 213.

Through the kindness of Dr. Alexander G. Ruthven, Director of the Museum of Zoology, University of Michigan, I have been able to study Shull's specimen of "*Trichothrips beachi*," recorded by him from Huron County, Michigan. It agrees perfectly with the macropterous paratypes of *T. americanus*, though bearing in Doctor Hinds' writing the following label: "*Trichothrips beachi* Hinds. (Probably this sp.) Det. W. E. Hinds, Nov. 17, 1908." This is the only specimen which has come to hand since the description of the species.

Trichothrips zonatus sp. nov.

(Plate 3, fig. 2.)

Female (macropterous).—Length about 1.5 mm. Color ochraceous yellow, with head, segments 1, 2, and 4–8 of antennæ, most of pterothorax, and apical .7 of tube, dark blackish brown; legs yellow.

Head very slightly longer than wide, rounded in front; vertex abruptly declivous; cheeks subparallel, converging rather abruptly to eyes, sparsely spinose, without lines of sculpture; postocular bristles pointed, twice as long as eyes. Eyes less than one-third as long as head, slightly protruding, half as wide as their interval. Ocelli present; anterior ocellus slightly overhanging, directed forward; posterior ocelli opposite anterior half of eyes, their diameter fully one-third the width of eyes. Antennæ eight-segmented, about 2.2 times as long as head; segments 1 and 2 subequal in length, distinctly shorter than 3, which is the longest in entire antenna and claviform; 4–8 subequal in length, stout, pedicellate; bristles and sense cones unusually long. Color of antennæ: Segments 1 and 2 blackish brown, 2 paler apically and at middle; 3 yellow, infuscate at apex; 4–8 nearly black, distinctly darker than 1 and 2. Mouth cone half as long as width of head, broadly rounded at apex, reaching two-thirds across prosternum.

Prothorax about .7 as long as head and (inclusive of coxæ) twice as wide as long; notum with the midlateral, posterior angular, and posterior marginal bristles unusually long and prominent, pointed; anterior angulars and anterior marginals reduced in size and barely visible; coxal bristles about one-third as long as postoculars. Pterothorax slightly wider than prothorax, darkest in color at sides of metathorax. Wings slender, narrowed apically, darkened with brown at base and in apical third, intervening portion nearly white; fore wings without double subapical fringe on posterior margin. Legs uniform yellow except for the brown ends of tarsi; fore femora shorter than head and slightly more than twice as long as wide; fore tarsi unarmed.

Abdomen moderately broad, about 1.25 times as wide as prothorax. Tube about .8 as long as head and twice as long as basal width, which is 2.5 times the apical; sides nearly straight. Abdominal bristles long, pointed; terminal bristles and those on segment 9 equal in length to tube.

Measurements of holotype: Length 1.46 mm.; head, length .204 mm., width .197 mm.; prothorax, length .144 mm., width (inclusive of coxæ) .288 mm.; pterothorax, width .306 mm.; abdomen, width .360 mm.; tube, length .168 mm., width at base .089 mm., at apex .036 mm. Antennal segments: 1, 57μ; 2, 57μ; 3, length 70μ, width 37μ; 4, 53μ; 5, 53μ; 6, 53μ; 7, 51μ; 8, 56μ; total length of antenna .45 mm.

Described from one female taken by sweeping at Corozal, Canal Zone, Panama, October 19, 1911, by Mr. James Zetek.

The chætotaxy, coloration, and unarmed fore tarsi indicate a very distinct species.

Trichothrips ambitus Hinds.

1902. *Trichothrips ambitus* Hinds, Proc. U. S. Nat. Mus., vol. XXVI, p. 191, Pl. VIII, figs. 81, 82.

This species has not been mentioned in the literature since its original description in 1902 from one female taken at Amherst, Massachusetts. Two males are in the collection before me, one taken in miscellaneous collecting at Carbondale, Illinois, May 19, 1908, by Mr. Charles A. Hart; the other found on a branch of a willow tree at Bluemont, Virginia, August 31, 1913, by the writer. They do not differ sufficiently from Doctor Hinds' characterization of the opposite sex to require a separate description at present.

Haplothrips graminis Hood.

1912. *Haplothrips graminis* Hood, Proc. Biol. Soc. Wash., vol. XXV, p. 69, fig. 3.

Notwithstanding its several structural differentia, this species bears a close superficial resemblance to *H. statices* (Haliday), though apparently more southern in distribution. Specimens from Auburn, Alabama, were collected August, 1908, by Dr. W. E. Hinds, and sent me under the name *Anthothrips niger.* It has also been taken at Marshalltown, Iowa, by Mr. E. O. G. Kelly.

Haplothrips nubilipennis sp. nov.

(Pl. 3, figs. 3 and 4.)

Female.—Length about 1.6 mm. Color blackish brown, with maroon hypodermal pigmentation in head, thorax, and first nine segments of abdomen; segments 1 and 2 of antennæ about concolorous with head; 3–6 yellowish brown, irregularly clouded with darker; 7 and 8 uniform dark yellowish brown, paler than the two basal segments; all tarsi and apex of fore tibiæ, bright yellow.

Head about 1.34 times as long as wide, broadest at about middle; cheeks gently rounded, slightly convergent posteriorly; vertex slightly produced, the anterior ocellus overhanging; dorsal and lateral surfaces with a few, very weak, anastomozing lines, sparsely and briefly spinose; postocular bristles two-thirds as long as eyes, blunt. Eyes one-third as long as head. Posterior ocelli opposite anterior third of eyes. Antennæ 1.8 times as long as head, slender, their form and structure well shown in figures (Pl. 3, figs. 3 and 4); segment three conical, symmetrical, about twice as long as greatest width, subequal in length and width to 2 and 4, with a sense cone on outer, and one on inner, surface. Color of antennæ: Segments 1 and 2 dark blackish brown, the former pale at base, the latter at middle and apex; 3–6 yellowish brown, irregularly clouded with darker; 7 and 8 uniform dark yellowish brown, paler than the two basal segments. Mouth cone normal to genus.

Prothorax about .6 as long as head and (inclusive of coxæ) about 2.2 times as wide as long, surface nearly smooth; anterior marginal bristles greatly reduced in size and barely visible; other blunt, the two pairs at the posterior angles about as long as postoculars, midlaterals and anterior angulars two-thirds as long. Wings distinctly narrowed at middle, clouded with gray, the fore pair with a nearly black, sharply defined patch at base and another paler and more suffused one just before middle; four interlocated hairs on posterior margin near apex. Fore tarsi with a small, acute tooth.

Abdomen slightly wider than pterothorax. Tube about .64 as long as head, just twice as long as basal width, and about twice as wide at base as at apex. Abdominal bristles pointed; terminal bristles nearly as long as tube.

Measurements of holotype: Length 1.61 mm.; head, length .226 mm., width .168 mm.; prothorax, length .138 mm., width (inclusive of coxæ)

.306 mm.; pterothorax, width .336 mm.; abdomen, width .372 mm.; tube, length .144 mm., width at base .072 mm., at apex .035 mm. Antennal segments: 1, 39μ; 2, length 54μ, width 31μ; 3, length 60μ, width 31μ; 4, length 60μ, width 31μ: 5, 56μ; 6, 51μ; 7, 50μ; 8, 36μ; total length of antenna .406 mm.

Described from one female taken under a loose scale of the bark of a living white oak tree, near Baldwin, Michigan, August 23, 1908, by the writer.

The clouded wings and the structure of the antennæ are distinctive.

Haplothrips faurei sp. nov.

(Pl. 3, figs. 5 and 6.)

Female.—Length about 1.4 mm. Color dark blackish brown, with profuse maroon hypodermal pigmentation; antennal segments 3–6 lemon-yellow; fore tibiæ and fore tarsi yellow, the former shaded with blackish brown at base and along lateral surfaces; middle and hind tarsi light yellowish brown.

Head somewhat longer than wide, broadest a little behind middle; cheeks gently rounded, slightly convergent posteriorly; vertex slightly produced, the anterior ocellus overhanging; dorsal and lateral surfaces with a few, very weak, anastomozing lines, sparsely and briefly spinose; postocular bristles two-thirds as long as eyes, blunt. Eyes slightly more than one-third as long as head, very slightly, if at all, protruding. Ocelli anterior in position, the posterior pair opposite anterior third of eyes. Antennæ about 1.7 times as long as head, moderately slender; segment 3 conical, nearly symmetrical, twice as long as greatest width, distinctly narrower than, and subequal in length to, 2 and 4; 4 and 5 distinctly longer than wide, pedicellate, narrowed apically; 6 and 7 oblong, pedicellate, the former broader toward apex, the latter broader toward base; 8 slender, about three times as long as wide; sense cones and spines short and slender, segment 3 without cone on inner surface. Color of antennæ: Segments 1 and 2 dark blackish brown, the latter paler toward apex and at middle; 3–6 clear lemon-yellow, 6 more or less infuscate apically; 7 and 8 yellowish brown. Mouth cone normal to genus.

Prothorax about two-thirds as long as head and (inclusive of coxæ) about 2.3 times as wide as long, surface nearly smooth; anterior marginal bristles greatly reduced in size and barely visible; others blunt, the two pairs at the posterior angles longest. Wings distinctly narrowed at middle; fore wings with a slight brownish cloud at extreme base and with about 9 interlocated hairs on posterior margin near apex. Fore tarsi with a minute, acute tooth.

Abdomen slightly wider than pterothorax. Tube about .66 as long as head, twice as long as basal width, and twice as wide at base as at apex, suffused with hypodermal pigmentation. Abdominal bristles pointed; terminal bristles nearly equal in length to tube.

Measurements of holotype: Length 1.38 mm.; head, length .190 mm., width .184 mm.; prothorax, length .120 mm., width (inclusive of coxæ) .282 mm.; pterothorax, width .312 mm.; abdomen, width .336 mm.; tube, length .126 mm., width at base .060 mm., at apex .033 mm. Antennal segments: 1, 30μ; 2, 48μ; 3, length 51μ, width 26μ; 4, length 52μ, width 32μ; 5, 48μ; 6, 41μ; 7, 36μ; 8, 25μ; total length of antenna .331 mm.

Described from six females, bearing the following data: Ithaca, New York, Oct. 4, 1912, 2 females, "on ivy foliage," J. C. Faure; Florida, N. Y., Aug. 15, 1912, 4 females "on willow leaves, predaceous on mites," J. C. Faure.

Type locality: Ithaca, New York.

This distinct little species resembles *H. verbasci* (Osborn) at first sight, though the reduction of the anterior marginal bristles of the prothorax and the absence of the usual sense cone from the inner surface of the third antennal segment ally it more closely to *H. graminis* Hood. The form of the antennal segments, especially the third, and the coloration, are distinctive.

It is named for Mr. J. C. Faure, formerly an entomological student at Cornell University, whose interest in this order of insects has materially increased our American list.

Haplothrips humilis sp. nov.

(Pl. 4, figs. 1 and 2.)

Female.—Length about 1.3 mm. Color dark blackish brown; segments 3–6 of antennæ successively darker in color, 3 usually nearly clear yellow, 6 yellowish brown; fore tarsi yellow; fore tibiæ yellow apically.

Head about 1.1 times as long as wide; sides nearly parallel, very gently rounded, somewhat convergent posteriorly; vertex slightly produced, the anterior ocellus overhanging; dorsal and lateral surfaces sparsely and briefly spinose; postocular bristles about equal in length to eyes, pointed. Eyes slightly more than one-third as long as head, not protruding. Ocelli anterior in position, the posterior ocelli opposite anterior third of eyes. Antennæ about 1.5 times as long as head, moderately stout, form and structure well shown in figures (Pl. 4, figs. 1 and 2); segment 3 about 1.7 times as long as wide, asymmetrical, distinctly shorter than 2 and 4, narrower than the latter, without sense cone on inner surface. Color of antennæ: Segments 1 and 2 dark blackish brown, the latter paler toward apex and at middle; 3–6 successively darker in color, progressing from a nearly clear yellow to a light blackish brown; 7 and 8 darker blackish brown. Mouth cone normal to genus.

Prothorax about two-thirds as long as head and (inclusive of coxæ) nearly twice as wide as long, surface nearly smooth; anterior marginal bristles greatly reduced in size and barely visible; others blunt, the two pairs at the posterior angles nearly as long as postoculars, midlaterals and anterior marginals two-thirds as long. Wings distinctly narrowed at middle; fore wings with a slight brownish cloud at extreme base and with about 8 interlocated hairs on posterior margin near apex. Fore tarsi with a distinct acute tooth.

Abdomen slightly wider than pterothorax. Tube about half as long as head, less than twice as long as basal width, and nearly twice as wide at base as at apex. Abdominal bristles pointed; terminal bristles about one-fourth longer than tube.

Measurements of holotype: Length 1.26 mm.; head, length .210 mm., width .180 mm.; prothorax, length .144 mm., width (inclusive of coxæ) .280 mm.; pterothorax, width .318 mm.; abdomen, width .360 mm.; tube, length .108 mm., width at base .060 mm., at apex .033 mm. Antennal segments: 1, 36μ; 2, length 48μ, width 28μ; 3, length 41μ, width 24μ; 4, length 47μ, width 30μ; 5, 45μ; 6, 41μ; 7, 41μ; 8, 30μ; total length .329 mm.

Described from five females taken by sweeping on "Moro Island, Panama (near Taboga Island, Bay of Panama), October 17, 1913," by Mr. James Zetek.

The form and size of the third antennal segment and the absence of the usual sense cone from its inner surface, together with the character of the prothoracic bristles and the unusually short tube, would seem to indicate a very distinct species.

Glyptothrips flavescens Hood.

1912. *Pactothrips* [lapsus, *Glyptothrips*] *flavescens* Hood, Psyche, vol. XIX, p. 116, Pl. 9, figs. a–e.

Seven apterous females and four apterous males of this anomalous Phlœothripid were taken in grass sod at Chester, New York, April 2, 1913, by Mr. J. C. Faure. The species was known previously from three macropterous females, collected in Illinois. Except for the absence of ocelli and wings and the consequent reduction in the size of the pterothorax, the specimens agree closely with the types. The males differ in being smaller and slightly more slender.

Rhynchothrips tridentatus (Shull).

(Plate 4, figs. 4 and 5.)

1909. *Trichothrips tridentatus* Shull, Ent. News, vol. XX, p. 226, fig. 6.

1912. [*Rhynchothrips*] *tridentatus* Hood, Proc. Ent. Soc. Wash., vol. XIV, p. 141.

Both this species and Moulton's *Trichothrips ilex* are described as having all tarsi armed with a tooth. The term "tarsal tooth," however, since the time of Uzel's epoch-making work, has been taken to mean a chitinous evagination of the inner surface of the tarsus near its base; while the structures seen by Shull and Moulton are the *articulated claws* at the *apex* of the tarsus,—almost certainly present in every species of the order Thysanoptera. Teneral specimens often show these claws very clearly, and this is the explanation for the prominence which Shull gives the character in his description, for both of his types are freshly emerged specimens.

In 1895 Uzel described the mechanism of the tarsal claws on pages 304 and 305 of his "Monographie," and figured the tarsus of the larva of *Trichothrips copiosus* on Tab. VIII, figs. 152–155. One of his more pertinent sentences, freely translated from the Bohemian, is as follows: "On the extremity, the tarsus of the fringe-wings has two movable claws which are strongly united to the dilation of the integument which is found between them." It will thus be noticed that the presence of such claws is an ordinal character instead of a specific one.

The antenna, also, of *tridentatus* is misleadingly described and figured by Shull, because observed in lateral aspect. The true form of the distal segments and the structure of the head and prothorax are shown in the figures given herewith.

The species is common on various oaks, and has been examined by the writer from the following localities: Anna, Illinois, June 27, 1909, C. A. Hart; Boskydell, Ill., Oct. 21–23, 1908, L. M. Smith; Carbondale, Ill., Oct. 15, 16, 1908, L. M. Smith; Farrington, Ill., April 10, 1909, H. E. Ewing; Marshall, Ill., Oct. 3, 1908, H. E. Ewing; Mounds, Ill., Aug. 9, 1909, J. D. Hood; Murphysboro, Ill., Nov. 6, 1908, L. M. Smith; Pulaski, Ill., Oct. 27, 1908, L. M. Smith, and May 29, 1909, C. A. Hart; Urbana, Ill., Nov. 15, 1907, R. D. Glasgow, Jan. 29, 1908, J. D. Hood and H. E. Ewing, June 9, 1909, C. A. Hart and F. D. Shobe; Baldwin, Michigan, Aug. 15, 23, and 31, 1908, J. D. Hood; Wittenberg, Missouri, July 12, 1909, C. A. Hart; Plummer's Island, Maryland (near Washington, D. C.), April 6, 1913, J. D. H.; Cabin John, Md., June 8, 1913; Washington, D. C., June, 1913, J. R. Malloch and J. D. H., reared.

Liothrips caryæ (Fitch).

(Plate 4, fig. 6.)

1856. *Phlœothrips caryæ* Fitch, Third Rept. Nox. Ins. State N. Y., in Ann. Rept. N. Y. State Agr. Soc., vol. XVI, p. 445.

This species, though occasionally referred to since its original description, has virtually been lost to science for nearly sixty years. In Illinois and Maryland I have found it commonly in May and June on the leaves of hickory and in old, dried, phylloxera galls. The thrips are certainly not concerned in the making of the galls, and probably frequent them only to secure protection during metamorphosis.

Fitch's description, now out of print and very rare, is as follows:

> 165. Hickory Thrips, *Phlœothrips Caryæ*, new species. (Homoptera. Thripididæ.)
>
> Slender conical protuberances like the spur of a cock a quarter of an inch long, standing out perpendicularly from the under surface of the leaf and closed at their end, with a similar protuberance upon the opposite side of the leaf having its end open and split into several long slender teeth; within these galls a small slender shining black insect with the middle joints of its antennæ honey-yellow and its long narrow white wings appressed to its back.
>
> Whether these singular galls, which resemble a long slender pod thrust half way through the leaf, are produced by the Thrips found in them, or by some other insect which forsakes them before this takes up its abode

> there, I am unable to say. In the instance in which I noticed them particularly, they occurred upon a young shag-bark hickory in the month of September. Quite a number of the leaves had one and several had two or more galls growing upon them, in each one of which was one or more of these insects or their larvæ. The galls were of a very tough leathery texture, green where they adjoined the leaf and deep purple at their ends, though most of them at that date had become dry and faded to a dark brown color. The leaf is often wrinkled around the gall and has more or less of a fold extending from thence to its outer edge. The insect within, when disturbed, turns its tail upward over its back in a menacing manner, the same as the rove beetles (*Staphylinidæ*) do; and when the point of a needle which has been pressed upon one of these insects is touched to the tip of the tongue, unless my imagination greatly deceives me, it will frequently be found to impart a peculiar acrid biting sensation. This insect is 0.07 long, of a deep black color and highly polished. Its head is narrower than the thorax and nearly square. The third, fourth and fifth joints of the antennæ are longer than the others, yellow and slightly transparent; the last joint is shortest and but half as thick as those which precede it. The abdomen is egg-shaped with its tip drawn out into a tube thrice as long as it is thick, with four long bristles at its end, and the abdomen is furnished with bristles at each of its sutures. The wings do not reach the tip of the abdomen. They are white and slightly transparent and fringed with black hairs. In its larva state it has a more slender linear form with a dull greenish yellow head, a white thorax with a broad black band anteriorly, a pale red abdomen with a black band at its tip, and whitish legs.

The description quoted above of the adult insect is not sufficiently detailed to distinguish it readily from the many other species of the genus which have been diagnosed in recent years. The following should enable it easily to be recognized:

Female.—Length about 2.0 mm. Color dark blackish brown or black; tarsi and articulations of legs paler; antennal segments 3–6 largely yellow in basal portions.

Head about 1.14 times as long as wide, broadest just behind eyes; cheeks gently arched, slightly convergent posteriorly; vertex truncate, not at all produced, abruptly declivous, the anterior ocellus distinctly overhanging; dorsal and lateral surfaces deeply and closely roughened with transverse lines and set with several short spines; postocular bristles pointed, about as long as eyes. Eyes about one-third as long as head, not protruding. Posterior ocelli opposite line drawn behind anterior third of eyes. Antennæ twice as long as head, form and structure well shown in figure (Pl. 4, fig. 6); sense cones small; formula: 3, 0–1; 4, 1–2+^{1}; 5, 1–1+^{1}; 6, 1–1+^{1}; 7 with 1 on dorsum near apex. Color of antennæ: Segments 1 and 2 nearly concolorous with head, 2 yellowish apically; 3 nearly clear yellow, usually infuscate in apical third; 4–6 yellowish, successively darker in color, irregularly marbled with brown apically; 6–8 uniform blackish brown or with pedicel of 7 paler. Mouth cone subacute, nearly attaining base of prosternum.

Prothorax about .6 as long as head and (inclusive of coxæ) nearly 2.5 times as wide as long; all bristles present, pointed, unusually long for the genus, the two pairs at the posterior angles nearly as long as prothorax; other bristles about half as long; coxal bristle pointed, sill shorter. Pterothorax wider than prothorax and longer than wide; sides slightly arcuate, converging posteriorly. Wings long, closely fringed, slightly broadened apically; fore wings lightly shaded with brownish yellow at base, remainder clear white; posterior margin with about 20 interlocated hairs. Fore tarsi unarmed.

Abdomen large and heavy, wider than pterothorax. Tube .9 as long as head and nearly three times as long as basal width, which is about twice the apical. Abdominal bristles moderately long, yellow (or brown) in color, pointed; terminal bristles brown, about four-fifths as long as tube.

Measurements of neoholotype: Length 2.00 mm.; head, length .268 mm., width .235 mm.; prothorax, length .168 mm., width (inclusive of coxæ) .415 mm.; pterothorax, width .456 mm.; abdomen, width .528 mm.; tube, length .246 mm., width at base .087 mm., at apex .041 mm. Antennal segments: 1, 54μ; 2, 69μ; 3, length 84μ, width 36μ; 4, length 78μ, width 40μ; 5, 74μ; 6, 72μ; 7, 66μ; 8, 42μ; total length of antenna .54 mm.

Male.—Length about 1.8 mm. Slightly smaller and more slender than female, otherwise almost identical.

Redescribed from many specimens of both sexes as follows: Carbondale, Illinois, June 27–29, 1907, J. D. Hood, both sexes reared abundantly from pupæ taken in phylloxera galls on hickory leaves; Hillery, Ill., June 10, 1908, C. A. Hart, both sexes common on hickory leaves; Mt. Carmel, Ill., May, 1884, in phylloxera galls on hickory leaves (Acc. No. 2358, Ill. State Lab. Nat. Hist.); Pulaski, Ill., May 21, 1907, C. A. Hart, 1 male swept from grass and weeds; Plummer's Island, Maryland, June 8 and 29, 1913, J. D. H., on hickory leaves, and reared from pupæ in phylloxera galls on hickory leaves.

The large size, truncate vertex, long, pointed bristles, and the long tube are the principal diagnostic characters.

I have designated the above specimens as the "neotypes" of the species, Fitch's original types having been lost.

Leptothrips mali (Fitch).

1855. *Phlæothrips Mali* Fitch, First Rept. Nox. Ins. State N. Y., p. 102; also in Trans. N. Y. State Agr. Soc., vol. IV, for 1854, p. 806.
1902. *Cryptothrips aspersus* Hinds, Proc. U. S. Nat. Mus., vol. XXVI, p. 205, Pl. X, figs. 104–106.
1904. *Cryptothrips californicus* Daniel, Ent. News, vol. XV, p. 293.
1907. *Cryptothrips californicus* Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 66.
1908. *Cryptothrips aspersus* Franklin, Proc. U. S. Nat. Mus., vol. XXXIII, p. 727.
1908. *P[hyllothrips] aspersus* Hood, Can. Ent., vol. XL, p. 305.
1909. *Phyllothrips aspersus* Hood, Ent. News, vol. XX, p. 32, fig. 4.
1909. *Leptothrips aspersus* Hood, Ent. News. vol. XX, p. 249.
1909. *Leptothrips aspersus* Crawford, Pomona Coll. Journ. Ent., vol. I, p. 121.

1910. *Liothrips mcconnelli* Crawford, Pomona Coll. Journ. Ent., vol. II, p. 163, fig. 68, A–G.
1911. *Cryptothrips californicus* Moulton, Tech. Ser. 21, Bur. Ent., U. S. Dept. Agr., p. 32, Pl. VI, figs. 45, 46.
1911. *Leptothrips aspersus* Idem, ibidem.
1911. *Liothrips mcconnelli* Idem, ibidem, p. 33.
1911. *Phyllothrips aspersus* Shull, Pub. 4, Mich. Geol. and Biol. Surv., p. 213.
1912. *Leptothrips aspersus* Back, Ent. News, vol. XXIII, p. 73.
1912. *Leptothrips aspersus* Hood, Proc. Biol. Soc. Wash., vol. XXV, p. 62.
1913. *Leptothrips aspersus* Hood, Psyche, vol. XX, p. 121.
1913. *Leptothrips aspersus macro-ocellatus* Watson, Ent. News, vol. XXIV, p. 148.
1913. *Leptothrips aspersus* Morgan, Proc. U. S. Nat. Mus., vol. 46, pp. 38, 46.

A study of Fitch's description of *Phlœothrips mali* has convinced the writer that *Leptothrips aspersus* (Hinds), with its several synonyms, is identical therewith. The description is of a blackish purple Phlœothripid on apple, 1.5 mm. in length and only one-sixth as broad, with the third antennal segment white, and the head longer than wide. *Leptothrips aspersus* agrees perfectly with *mali* in these several particulars, and, furthermore, is the only known member of its suborder in the United States which could possibly be described as "blackish purple" in color. It is very common on apple leaves in Illinois, and is the only external feeder which I have ever seen on that tree.

The type of *Phlœothrips mali* has evidently been lost, and Doctor Hinds' type of *Cryptothrips aspersus* may properly be considered the neoholotype.

Doctor Fitch's account of this insect is no doubt inaccessible to most Thysanopterists and so is reproduced below:

> In the month of August several apples were noticed upon the trees, which were small, withered, and ready to fall, yet without any of those worms in them which occasion the destruction of so much fruit at this season of the year. On searching for the cause of this withering of these apples we found a small cavity or little hollow at the tip end, commonly close beside the relics of the flower. This cavity had the appearance of having been gnawed; it was about the size of a pea, and its surface of a black color. Several of these cavities were occupied by a minute slender insect; and from appearances I inferred that the young of these insects had taken up their residence upon the apples whilst they were quite small, and by wounding them slightly day after day, had retarded their growth and finally caused them to wither. It is possible that some other insect had originally produced these wounds, and that these which were now there had been attracted to the wounds to suck their juices; but every appearance indicated that these were the real culprits. . . . This which occurs in wounded spots upon young apples, appears to pertain to the genus named *Phlæothrips* by Mr. Haliday, and I propose for it the specific name *Mali*, or the Apple Thrips.
>
> This insect measures only six-hundredths of an inch in length and one-

hundredth in width. It is polished and shining, and of a blackish purple color. Its antennæ which are rather longer than the head and composed of eight nearly equal joints, have the third joint of a white color. The abdomen is concave on its upper side, and is furnished with a conical tube at its tip which has a few bristles projecting from its apex. The wings when folded are linear, silvery white, and as long as the abdomen ; they are pressed closely upon the back, spreading asunder at their bases, and appear like an elongated white Y-shaped mark. Viewed from above, the head is of a square form, longer than wide. The first segment of the thorax is well separated from the second, is broadest at its base, and gradually tapers to its anterior end, where it is as wide as the head. The following segment is the broadest part of the body and square, with its length and breadth equal.

Acanthothrips albivittatus Hood.

1908. *Acanthothrips albivittatus* Hood, Bull. Ill. State Lab. Nat. Hist., vol. VIII, art. II. p. 374.

1912. *H*[*oplothrips*, lapsus] *albivittatus* Hood, Can. Ent., vol. XLIV, p. 143, footnote.

Since its description in 1908 from one female taken at Bloomington, Illinois, this species has come to hand from the following localities: Carbondale, Illinois, October 16, 1908, L. M. Smith, 1 female from branch of oak; Makanda, Ill., Sept. 25, 1908, L. M. Smith, 1 female "found on wrist while examining apple leaves" ; Washington, D. C., June 15–21, 1913, J. R. Malloch and J. D. Hood, 3 females and 2 males reared from nymphs taken June 10 on trunk of dying red oak tree.

The male differs from the female in so few particulars that an additional description of that sex is unnecessary. The black antennæ and white dorso-lateral stripes are distinctive.

Genus **Dichætothrips** nov.

(*δύο*, two; *χαίτη*, bristle; *θρlψ*, a wood worm.)

Head subrectangular, much longer than broad, more than twice as long as median dorsal length of pronotum; vertex not produced; cheeks smooth, sparsely spinose; postocular bristles long, pointed; postocellar bristles exceedingly long, nearly as prominent as the postoculars. Antennæ eight-segmented; segments 4–6 without ventral prolongations at apex; segment 4 longest. Eyes small, about one-fourth as long as head. Anterior ocellus directed forward. Mouth cone not as long as wide, semicircular at apex, slightly surpassing middle of prosternum. Prothorax more than three times as wide across coxæ as median length of dorsum ; posterior margin nearly straight; anterior margin almost semicircularly emarginate, conspicuously thickened; anterior marginal and anterior angular bristles minute, others well developed. Fore tarsi strongly armed. Wings broad, slightly expanded apically. Abdomen broad and heavy; tube large and stout, about as long as head.

Type : Dichætothrips brevicollis sp. nov.

The close relationship existing between this genus and *Diceratothrips* Bagnall is party responsible for the similarity of the two names. In each of these genera one pair of cephalic bristles, ordinarily minute and inconspicuous, is remarkably produced and thickened. In *Dichætothrips* this pair is the postocellar one; while in *Diceratothrips* it is a pair on the vertex, laterad of the median ocellus. The short, broadly rounded mouth cone, the stout tube, and the short, broad, semicircularly emarginate prothorax with its thickened anterior margin, are also distinctive. This last character seems to be unique, all other genera having this margin very weak, sometimes grading insensibly, or even irregularly, into the granulate membrane connecting the thorax with the head. Mr. Bagnall, after a study of the single specimen from which the genus is described, expressed himself as agreeing with the above interpretation of its affinities.

Dichætothrips brevicollis sp. nov.

(Plate 4, fig. 7.)

Female.—Length about 3.7 mm. Surface shining. Color nearly uniform piceous black, with tarsi and fore tibiæ yellowish.

Head subrectangular, 1.63 times as long as wide; vertex not produced, evenly declivous; frontal costa deeply and roundly emarginate; cheeks nearly parallel, very slightly converging to a short, abrupt, collar-like, basal widening; dorsal and lateral surfaces smooth, with about three pairs of short lateral spines, of which one (the largest) is on a line with the postocular bristles, the other two in basal third; postocular bristles pointed, two-thirds as long as head; postocellar bristles nearly as prominent as the postoculars, almost half as long as head. Eyes slightly less than one-fourth as long as head, subrectangular in form. Ocelli moderately large, their diameter about three times as great as that of facets of eyes; anterior ocellus apparently slightly overhanging, pointing directly forward; posterior ocelli widely separated, nearly contiguous to margins of eyes at a line drawn through middle of anterior half. Antennæ about 2.1 times as long as head; segments 3–7 claviform, elongate, 3–5 inflated in apical third, 4 and 5 both longer than 3; 8 nearily fusiform; sense cones long, slender, those on segment 3 nearly five-sixths as long as the segment itself. Color of antennæ: Nearly black, with base of segment 1, apex of 2, and base of 3, yellowish.

Prothorax along median dorsal line about one-third as long as head and (inclusive of coxæ) about 3.8 times as wide as long; posterior margin and sides nearly straight; anterior margin almost semicircularly emarginate, conspicuously thickened; anterior marginal and anterior angular bristles minute, about equal in size to those on cheeks; midlaterals about equal in length to postocellars, posterior marginals half as long (posterior angulars and coxals broken off in the unique type). Pterothorax slightly wider than prothorax, sides slightly arcuate and convergent posteriorly. Wings long and broad, closely fringed; fore wings slightly expanded apically and with about 35 interlocated hairs on posterior margin near apex; both pairs clouded with brown, more darkly at base, and with a post-median dark brown vitta. Fore femora about three times as long as wide, almost equal in length to head; fore tarsi with a stout and slightly curved tooth which is about as long as width of tarsus.

Abdomen slightly wider than pterothorax. Tube equal in length to head and 2.5 times as long as basal width, which is three times the apical; sides straight. Abdominal bristles pointed, those on segment 9 longer than tube; terminal bristles about half as long as tube.

Measurements of holotype: Length 3.65 mm.; head, length .540 mm., width .331 mm.; prothorax, length along median dorsal line .186 mm., width (inclusive of coxæ) .708 mm.; pterothorax, width .732 mm.; abdomen, width .804 mm.; tube, length .540 mm., width at base .216 mm., at apex .070 mm. Antennal segments; 1, 111μ; 2, 99μ; 3, length 165μ, width 60μ; 4, length 204μ, width 66μ; 5, 201μ; 6, 153μ; 7, 100μ; 8, 94μ; total length of antenna 1.13 mm.

Described from one female taken at Rockstone, British Guiana, February 28, 1913, by Mr. G. E. Bodkin, Government Economic Biologist.

Diceratothrips picticornis sp. nov.

(Plate 5, figs. 1 and 2.)

Female (macropterous).—Length about 3.1 mm. Color nearly piceous black, with knees, bases of femora, and first three antennal segments, yellow.

Head subrectangular, 1.28 times as long as wide, truncate in front; cheeks nearly parallel, very slightly arcuate, equally converging to eyes and to an abrupt collar-like basal widening about one-fourth as long as eye; dorsal and lateral surfaces with faint anastomozing lines, sparsely spinose, a pair of stouter spines at basal and apical thirds, respectively; postocular bristles pointed, about 1.6 times as long as eyes; a pair of prominent, stout bristles on front near eyes, half as long as postoculars. Eyes about one-fourth as long as head; inner margins nearly straight, subparallel, forming a broadly rounded acute angle with the posterior margins. Ocelli moderately large, their diameter about twice as great as that of facets of eyes; anterior ocellus situated on extreme vertex, slightly overhanging and pointing directly forward; posterior ocelli widely separated, nearly contiguous to margins of eyes. Antennæ inserted beneath vertex, 2.1 times as long as head; segments 3–5 claviform, elongate, 3 more than four times as long as its greatest subapical width; 6 and 7 oblong, pedicellate; 8 subconical; sense cones and bristles short. Color of antennæ: Segments 1–3 yellow, 1 slightly clouded at base with brown, 3 dark brown in apical seventh; 4–8 dark blackish brown, 4 paler in basal three-fourths. Mouth cone broadly rounded at apex, reaching well beyond middle of prosternum.

Prothorax along median dorsal line about .56 as long as head and (inclusive of coxæ) about 2.6 times as wide as long, sides nearly straight, surface nearly smooth; anterior angles not at all produced; usual spines all present, the pair at the posterior angles longest, slightly longer than postoculars; posterior marginals and coxals subequal in length, half as long as postoculars; other bristles minute, about as long as those on cheeks. Pterothorax slightly wider than prothorax, sides slightly arcuate and convergent posteriorly. Wings long and broad, closely fringed, clouded with brown, more darkly toward base; fore wings with about 35 interlocated hairs on posterior margin near apex. Legs shorter and stouter than usual in the genus; fore femora about 1.8 times as long as wide and slightly more than .8 as long as head, with two short, stout spines on inner surface near base; fore tarsi armed with a short and rather blunt tooth.

Abdomen slightly wider than pterothorax. Tube slightly longer than head and about 3.4 times as long as subbasal width, which is 2.3 times the apical; sides nearly straight, very slightly expanded basally, somewhat constricted apically. Abdominal bristles pointed, black at base, those on segment 9 equal in length to tube.

Measurements of holotype: Length 3.06 mm.; head, length .414 mm., width .324 mm.; prothorax, length along median dorsal line .228 mm., width (inclusive of coxæ) .588 mm.; pterothorax, width .636 mm.; abdomen, width .684 mm.; tube, length .456 mm., width at base .135 mm., at apex .059 mm. Antennal segments: 1, 70μ; 2, 93μ; 3, length 205μ, width 46μ; 4, 149μ; 5, 124μ; 6, 102μ; 7, 84μ; 8, 56μ; total length of antenna .88 mm.

Male (macropterous).—Very similar to female in structure, and of about the same size though slenderer.

Head about 1.58 times as long as greatest width; cheeks distinctly converging from eyes to basal fourth, thence subparallel.

Prothorax along median dorsal line about .7 as long as head and (inclusive of coxæ) nearly twice as wide as long, sides broadly rounded. Fore femora enlarged and swollen, 1.2 times as long as head and 1.8 times as long as wide, armed on inner surface with two stout teeth and several bristles (see Plate 5, fig. 2); apex of fore femora yellow; fore tibiæ yellow along middle.

Abdomen more slender than that of female; tube slightly shorter than head.

Described from one female and one male, taken in a moving train, Canal Zone, Panama, by Mr. James Zetek.

The antennal coloration will distinguish this species readily from its described congeners. The teeth on the inner surface of the fore femora of the male indicate a close relationship to *D. armatus* Bagnall, with which it has been compared by both Mr. Bagnall and myself.

Polyphemothrips corticis sp. nov.

(Plate 5, fig. 3.)

Female.—Length about 4.1 mm.; width of pterothorax .65 mm. Color blackish brown, with almost solid crimson hypodermal pigmentation, the abdomen appearing bright red to the naked eye; antennal segments 4–7 and basal portion of tube, black; segment 3 of antenna pale yellowish in basal two-thirds.

Head about 1.6 times as long as width at base, prominently elevated along anterior portion of median line; vertex elevated and produced, overhanging bases of antennæ; cheeks abruptly swollen on ventral lateral margin just behind eyes, thence gently converging to basal three-tenths, and widening again to base, the relative widths of the head at these points being in the relation of 34:31:37; lateral surfaces faintly subreticulate, sparsely spinose; postocular bristles pointed, about one-half longer than eyes. Eyes about one-fifth as long as head, abruptly protruding, lateral margins flattened posteriorly. Ocelli moderately large, closely approximate; anterior ocellus situated on extreme vertex, directed forward; *posterior ocelli distinctly in front of anterior margin of eyes.* Antennæ inserted on ventral surface, seven-segmented, 1.8 times as long as head; segments 1 and 2 shortest, subequal in length; 3–6 claviform, 4 slightly longer than 3; 7 fusiform, slightly longer than 6, with a faint suture on ventral surface at apical fifth. Color of antennæ: Segments 1 and 2 blackish brown; 3 brownish white, slightly darkened basally, apical third dark brown-black; *4–7 nearly opaque black,* slightly brownish *apically.* Sense cones long, slender; formula: 3, 1–2; 4, 2–2; 5, $1–1+^1$; 6, $1–1+^1$; 7 with one on dorsum at apical three-fourths. Mouth cone very blunt, broadly rounded, *nearly attaining mesosternum.*

Prothorax along median dorsal line about .35 as long as head and (inclusive of coxæ) about three times as wide as long; all usual bristles present, pointed; posterior marginals longest, about equal in length to postoculars; posterior angulars two-thirds as long; other bristles subequal, about one-third as long as posterior marginals. Pterothorax slightly narrower than prothorax, sides nearly parallel. Wings long, closely fringed, about 11 times as long as broad; fore wings clouded with brown, darker basally, with three more or less distinct longitudinal bands in basal two-thirds; posterior margin with about 44 interlocated hairs near apex. Legs slender; fore femora about as long as basal width of head and slightly more than one-third as wide as long; fore tarsi with a stout tooth, the apex of which is directed forward.

Abdomen (collapsed in the two types of this sex) probably about as wide as prothorax. *Tube .54 as long as head* and about 2.4 times as long as width at base, *basal width about 2.25 times the apical;* sides nearly straight. Abdominal bristles long, pointed, brown at base, those on segment 9 longer than tube; terminal bristles three-fourths as long as tube.

Measurements of holotype: Length 4.1 mm.; head, length .714 mm., width behind eyes .408 mm., behind middle .377 mm., at base .444 mm.; prothorax, length along median dorsal line .252 mm., width (inclusive of coxæ) .737 mm.; pterothorax, width .648 mm.; tube, length .384 mm., width at base .162 mm., at apex .072 mm. Antennal segments: 1, 108μ; 2, 111μ; 3, length 198μ, width 63μ; 4, 203μ; 5, 179μ; 6, 135μ; 7, 146μ; total length of antenna 1.08 mm.

Male.—(Plate 5, fig. 3.) Very much like female in color and general structure, but more slender.

Head of same form as in female; posterior ocelli on a line with anterior margins of eyes. Prothorax about .48 as long as head and (inclusive of coxæ) about 2.8 times as wide as long; median dorsal line with dark chitinous thickening. Fore femora nearly as long as head and about half as broad as basal width of head; fore tarsi with a stout tooth about three-fifths as long as width of tarsus, arising at a right angle.

Measurements of allotype: Length 3.62 mm.; head, length .600 mm., width behind eyes .372 mm., behind middle .312 mm., at base .352 mm.; prothorax, length .288 mm., width (inclusive of coxæ) .756 mm.; pterothorax, width .696 mm.; abdomen, width .660 mm.; tube, length .360 mm., width at base .149 mm., at apex .065 mm. Antennal segments: 1, 108μ; 2, 99μ; 3, length 183μ, width 60μ; 4, 186μ; 5, 162μ; 6, 123μ; 7, 138μ; total length of antenna 1.00 mm.

Nymph (probably in last instar).—Length about 3.8 mm. Color bright red, with antennæ, vertex, legs, and abdominal segments 1, 2, and 7, yellowish white; tube dark brown, nearly black at apex.

Described from two females, six males, and three nymphs, taken at Ancon, Canal Zone, Panama, November 4, 1913, by Mr. James Zetek. They were found on the branches and under the bark of a fallen dead tree, in company with a Tenebrionid beetle, *Doliema angustata* Champion.

This species agrees very well with the description of *P. brasiliensis*, except for the italicized portions of the above description, and the smaller size. *Brasiliensis* is said to be described from the male, though the drawing clearly shows the specimen to be a female.

Cryptothrips gilvipes sp. nov.

(Plate 5, fig. 4.)

Female (forma aptera).—Length about 2.6 mm. Color black, with first two antennal segments, legs, prothorax, mesothorax, and sides of metathorax orange-yellow; head brown; hypodermal pigmentation lemon-yellow.

Head 1.2 times as long as wide, narrowed posteriorly, and at base with neck-like constriction; lateral and dorsal surfaces without sculpture, sparsely and briefly spinose; vertex rounded and evenly declivous; postocular bristles one-third longer than dorsal length of eyes, pointed. Eyes flattened, protruding, produced posteriorly on ventral surface of head, widely separated, their dorsal interval a little greater than the ventral length. Ocelli minute, the posterior pair widely separated. Antennæ about 1.8 times as long as head, form and structure well shown in figure (Pl. 5, fig. 4). Color of antennæ: Segments 1 and 2 yellow, the latter shaded with brown along inner surface and at base; 3 with pedicel dark orange-yellow and apical region yellowish brown, intervening portion nearly black; 4–6 very dark blackish brown, irregularly paler near middle; 7 and 8 nearly coal black; sense cones and bristles short, slender, segment 3 with one sense cone on outer surface. Mouth cone less than half as long as face and about as long as wide; tip of labrum not attaining tip of labium, the interval about equal in length to second segment of maxillary palpus.

Prothorax two-thirds as long as head and (inclusive of coxæ) about 1.9 times as wide as long, with faint median thickening; posterior angular bristles nearly as long as postoculars; coxal bristle one-third as long; all other bristles minute and barely visible. Pterothorax slightly wider than prothorax, sides subparallel. Legs nearly uniform orange-yellow, except for a narrow wash of brown along outer surfaces of hind femora; fore tarsus unarmed.

Abdomen stout, heavy, about 1.4 times as broad as pterothorax. Tube three-fourths as long as head, slightly more than twice as wide at base as at apex, sides almost straight; abdominal bristles pointed, light brown; terminal bristles as long as tube.

Measurements of holotype: Length 2.59 mm.; head, length .348 mm., width .288 mm.; prothorax, length .288 mm., width (inclusive of coxæ) .438 mm.; pterothorax, width .480 mm.; abdomen, width .684 mm.; tube, length .264 mm., width at base .131 mm., width at apex .056 mm. Antennal segments: 1, about 75μ; 2, about 75μ; 3, 111μ; 4, length 102μ, width 42μ; 5, 96μ; 6, 75μ; 7, 58μ; 8, 50μ; total length of antenna .64 mm.

Described from one female taken by sweeping, at Plum Point, Maryland, August 9, 1913, by W. L. McAtee.

This is an easily recognized species, allied to *C. dentipes* (Reuter) and *C. bicolor* (Heeger). The short tube and the color of the legs and prothorax separate it readily from *dentipes*, while the coloration of the antennæ and the absence of a sense-cone on the inner surface of the third antennal segment should serve to distinguish it from *bicolor*.

Cryptothrips bicolor (Heeger).

1852. *Phlœothrips bicolor* Heeger, Sitzungsb. d. Akad. d. Wiss., Wien, IX, p. 477, tab. XVIII.
1889. *Phlœothrips bicolor* Uzel, Vesmír, rocník XVIII, str. 259.
1895. *Cryptothrips bicolor* Uzel, Monogr. d. Ordn. Thys., p. 235.

This species appears to have been recorded only from Austria, where it was taken at Vienna as early as 1808, and in Bohemia, by Uzel, at a later date. Mr. J. C. Faure collected two females and one male of a *Cryptothrips* which agrees exactly with Uzel's description of *bicolor*, at Canastota, New York, March 12, 1913, from grass. It has been impossible to compare these specimens with European ones, because of the rarity of the species, but the identification is almost certainly correct.

Megalothrips spinosus Hood.

1908. *Megalothrips* (?) *spinosus* Hood, Can. Ent., vol. XL, p. 306, figs. 16, 17.
1909. *Megalothrips* (?) *spinosus* Franklin, Ent. News, vol. XX, p. 231.
1910. *I[dolothrips] spinosus* Crawford, Pomona Coll. Journ. Ent., vol. II, p. 170.

Specimens of this large thrips have been examined by the writer from the following localities: Harrisburg, Pennsylvania (type locality), March 10, 3 females, "in burrows of Lepidopterous or Coleopterous larva in dead willow stem"; Rockville, Pa., November 10, 1912, A. B. Champlain, 23 females and 2 males, "from Cerambycid burrow in oak";

Nyack, New York, 1884, J. L. Zabriskie, 1 female, "ex. nest of *Ceratina dupla* Say" (coll. U. S. National Museum); Ithaca, N. Y., March 24, 1905, Miss Fletcher, 2 females, "from hole in dead twig" (from coll. J. C. Faure); Plummer's Island, Maryland (near Washington, D. C.), June 8–October 12, W. L. McAtee and J. D. Hood, both sexes and many nymphs from dead leaves in fork of willow tree, and from dead willow branch; Vienna, Virginia, April 7 and 19, 1913, R. A. Cushman, 2 females, in old galls of *Gnorimoschema gallæsolidaginis* on golden rod; Carbondale, Illinois, July 30, 1909, L. M. Smith, 1 female, "in jar in which twig-girdlers (*Oncideres cingulata* Say) were being bred from persimmon twigs"; Muncie, Illinois, July 24, 1909, J. D. Hood, 1 female, in burrow in dead willow stem, with numerous eggs and young nymphs; St. Paul, Minnesota, September 19, 1908, H. J. Franklin, 2 females, from dead limb of white birch (1 female now in writer's collection).

In the original description this species was placed with doubt in the genus *Megalothrips* Uzel and the statement made that the generic position must remain uncertain until the discovery of the male. Two years later Mr. D. L. Crawford remarked parenthetically that the species is "really an *Idolothrips*" and prophecied that "the males of *I. spinosus* will be found to have a large tarsal tooth." It was thus of great interest to me to note the prominent projections on the sixth abdominal segment of the males recorded above, nearly as shown by Uzel in his figure of *Megalothrips bonannii*, which make certain the reference of this species to *Megalothrips*.

EXPLANATION OF PLATES.

The minor bristles and spines have usually been omitted in the figures on the following three plates, because of their unimportance in the differentiation of species and the impossibility of observing them except in specially prepared mounts.

PLATE III.

Fig. 1. *Trichothrips karnyi major* subsp. nov. Head and prothorax, female (holotype).
2. *Trichothrips zonatus* sp. nov. Head and prothorax, female (holotype).
3. *Haplothrips nubilipennis* sp. nov. Head and prothorax, female (holotype).
4. *Haplothrips nubilipennis.* Segment 3 of left antenna, female (holotype).
5. *Haplothrips faurei* sp. nov. Segment 3 of left antenna, female (holotype).
6. *Haplothrips faurei.* Head and prothorax, female (holotype).

PLATE IV.

Fig. 1. *Haplothrips humilis* sp. nov. Head and prothorax, female (holotype).

2. *Haplothrips humilis.* Segment 3 of left antenna, female (holotype).

3. *Haplothrips gowdeyi* (Franklin). Segment 3 of left antenna, female (paratype).

4. *Rhynchothrips tridentatus* (Shull). Segments 6–8 of right antenna.

5. *Rhynchothrips tridentatus.* Head and prothorax, female.

6. *Liothrips caryæ* (Fitch) Hood. Head and prothorax, female (neoholotype).

7. *Dichætothrips brevicollis* gen. et sp. nov. Head and prothorax, female (holotype).

PLATE V.

Fig. 1. *Diceratothrips picticornis* sp. nov. Head and prothorax, female (holotype).

2. *Diceratothrips picticornis.* Right fore femur, male (allotype).

3. *Polyphemothrips corticis* sp. nov. Head and prothorax, male (allotype).

4. *Cryptothrips gilvipes* sp. nov. Head and prothorax, female (holotype).

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF THIRTY APPARENTLY NEW GRIZZLY AND BROWN BEARS FROM NORTH AMERICA.

BY C. HART MERRIAM.

The present publication contains preliminary descriptions of thirty apparently undescribed species and subspecies of the big Bears—Grizzlies and big Brown Bears—of various parts of western America from northern Mexico to Arctic Alaska. This will be followed in the near future by more complete descriptions with fuller comparisons, known ranges, measurements and other matter, illustrated by photographs of skulls and teeth.

Most of the species here published have been in manuscript for several years, and have been held back awaiting the acquisition of fuller material. Through the kindly cooperation of the principal museums of America* and of a considerable number of sportsmen and hunters, enough skulls—more than 500—have now been brought together to admit of working out the characters of most of the species, though much remains to be done in the way of mapping their geographic ranges.

It will be a surprise to many to be told that until within a few months no museum in America contained either a skin or a skull of the adult male of the great Plains Grizzly *Ursus horribilis*—the "White Bear" of Lewis and Clark—the first Grizzly to receive a scientific name. Until recently, not only were the characters of this splendid species unknown, but there was no certainty as to which of three neighboring species was entitled to the name.

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* American Museum of Natural History, New York; Carnegie Museum, Pittsburg; Field Museum of Natural History, Chicago; Museum of Comparative Zoology, Cambridge; Provincial Museum, Victoria, B. C.; Victoria Memorial Museum, Ottawa; Peabody Museum of Yale University; Museum of Vertebrate Zoology, University of California; and the Museums of the Universities of Iowa, Nebraska and Wyoming.

The specimens in hand prove that in several parts of the Rocky Mountain region of the United States and British Columbia and in parts of southeastern Alaska, two perfectly distinct species—in some cases three—occupy the same territory. This is a rather startling announcement but one concerning which there is not the shadow of a doubt.

The list of persons who have aided me by the loan of material is too long for publication in the present connection, but it is a pleasure as well as a duty to express my appreciation of the invaluable assistance rendered by the loan or presentation of skins and skulls of Grizzly and Brown Bears utilized in the preparation of the following descriptions. The persons who have helped me in this way are: Miss Annie M. Alexander, C. E. Aiken, Dr. J. A. Allen, Edward F. Ball, H. C. Beggs, Mrs. C. C. Beggs, John P. Bird, Robert K. Blake, W. C. Bradbury, Fred K. Burnham, Mr. and Mrs. E. S. Cameron, Elton Clark, Charles B. Cory, Charles R. Cross, Jr., Howard Eaton, J. D. Figgins, Joseph Grinnell, Samuel Henshaw, Dr. W. J. Holland, Dr. R. Houston, James T. Jardine, Francis Kermode, J. H. Kidder, Paul Kleineidam, Prof. S. H. Knight, Frederick Lambart, J. D. McGuire, George Mixter, Dr. Wm. Jason Mixter, G. Frederick Norton, Prof. C. C. Nutting, John M. Phillips, Warburton Pike, Wilson Potter, George D. Pratt, Dr. E. P. Richardson, Archibald Rogers, Carl Rungius, Homer E. Sargent, Professor W. B. Scott, Charles Sheldon, George Shiras, 3d & 4th, P. A. Taverner, E. R. Warren, A. Bryan Williams, W. W. Wood.

Ursus alexandrae* sp. nov.

Type from Kusilof Lake, Kenai Peninsula, Alaska. Sept. 1906. No. 4752 ♂ old, Mus. Vert. Zool., Univ. Calif. Orig. No. 218. (Skull, skin and skeleton complete.)

Characters.—Size large; skull long and narrow with exceptionally broad rostrum; pelage very uniform in color, scarcely or not grizzled. Claws enormous (2d foreclaw of type specimen measuring: length from upper base 91 mm.; height at base 25 mm.; breadth 11.5 mm.). The longest claw in Wilson Potter's specimen measures 120 mm.; in the male killed by Dall DeWeese 110 mm.

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*Named in honor of Miss Annie M. Alexander of Oakland, California, whose collection of Alaska Bears is second only to that of the Biological Survey and National Museum.

Color.—(Type specimen, very old male, in fresh short fall pelage:) pale, almost grayish, brown, becoming yellowish brown between ears, contrasting with pale brown of muzzle; legs and feet only slightly darker than back—entire animal remarkably unicolor; underfur plumbeous, crinkled and woolly. Another male, killed by Wilson Potter of Philadelphia in May, 1912 (belonging to skull No. 181102 U. S. Nat. Mus., Biological Survey Coll.—presented by Wilson Potter), is pale buffy inclining to light "reddish brown" throughout, without grizzly appearance; legs only slightly darker. One killed by Dall DeWeese of Canyon City, Colorado, Sept. 7, 1897, is described by him as "grayish-yellow," with legs and sides chocolate brown.

Cranial characters.—Skull large, long, rather narrow, with moderately spreading zygomata, short flattish frontal shield, outstanding postorbitals (with age); *very broad rostrum*, and long and high sagittal crest. Frontal shield not markedly elevated above plane of rostrum; posterior root of zygoma not expanded. Canines large and long.

Skull of male adult compared with male adult kenaiensis—the only other large bear known to inhabit Kenai Peninsula: Basal length, palate, and occipito-sphenoid essentially same; skull as a whole much narrower, frontal shield interorbitally and across postorbital processes *much narrower*, flatter, more horizontal, not materially elevated above plane of rostrum; zygomata much less widely spreading, squamosal part much narrower (not expanded); sagittal crest much longer, reaching anteriorly over posterior ⅓ of frontals [in *kenaiensis* ending on or near fronto-parietal suture]; posterior third of frontals compressed, rising in a keel to sagittal crest; condyle of jaw, and glenoid fossa short (not produced outwardly as in *kenaiensis*). Canine teeth, both upper and lower, but especially the lower, much larger and longer.

Remarks.—The skull of *Ursus alexandrae* is of a generalized type, lacking the special distinctive features that characterize several of its neighbors—as *kenaiensis*, *sheldoni*, and others—none of which are Grizzlies. Among the Grizzlies it stands alone in the *great breadth of the rostrum*—which in bears of its size is only exceeded by the widely different *Ursus kenaiensis*, which can not be classed as a Grizzly. *Ursus alexandrae* attains to the largest size known among the Grizzly Bears, the biggest skulls equalling those of the huge *Ursus magister* of Southern California.

Ursus eltonclarki * sp. nov.

Type from near Freshwater Bay, Chichagof Island, the more northern of the Sitka Islands, Alaska. ♂ adult No. 179066 U. S. Nat. Mus., Biological Survey Coll. Collected May 19, 1912, by Elton Clark and by him presented to Biological Survey.

Characters.—Size medium or rather small; skull small, long, narrow, and rather low, with flat frontal shield. Claws of true Grizzly type—smoothly polished; strongly curved and rather short; longest claw (in type specimen) from upper base 70 mm; dark bluish or plumbeous horn color streaked with whitish or yellowish.

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* Named in honor of Elton Clark, of Boston, who killed and presented the type specimen.

Color.—Color of type very dark and rich. Nose pale brown, darkening just in front of eyes; face, head, and throat rich dark chocolate brown, with golden brown wash in front of ears; ears and patch under each ear dusky; occiput and neck grizzled golden brown; back pale, overlaid by buffy tips; legs and feet varying from blackish brown to brownish black.

Cranial characters.—Skull of male adult (the type) elongate, narrow; zygomata moderately spreading, outbowed, rounded posteriorly, squamosal part not vertically expanded; frontal shield in same plane with rostrum, narrow, flat or slightly concave, acutely rather short-pointed posteriorly, the point entering sagittal crest about one-third the distance from fronto-parietal suture to postorbital processes; sagittal crest moderate, reaching a little more than half way from occiput to postorbital processes; postorbital processes rather thick, outstanding; fronto-nasal region elevated (not dished); rostrum high and sloping gently upward in plane of frontals; lachrymal opening within orbit; palate long and narrow; postpalatal shelf long; postpalatal notch long and narrow; occipitosphenoid short, about 80 mm.; basisphenoid deeply concave, without trace of median ridge. Lower jaw long. Teeth moderate: canines rather long; pm_4 with moderately sloping heel slightly upturned at tip, sulcus very shallow; m_1 rather short, with cusplet on inner side of saddle posteriorly; m_2 with anterior moiety decidedly longer than posterior and twin cusps of entoconid small and not deeply notched; pm^4 large and broad; m^1 broad and rather short; m^2 broad in anterior half, then narrowing strongly, the heel obliquely truncate on outer side; cusps rather weak.

Skull of adult female similar, but much smaller, distinctly dished, point of shield lyrate, zygomata more angular.

Adult male eltonclarki (the type) compared with adult orgilos (the type): Size essentially same; vault of cranium higher; rostrum and fronto-nasal region longer and more elevated; postorbital processes heavier and shorter; occipito-sphenoid much shorter (80 mm. contrasted with 90); mandible more massive. Canines larger and longer; m_1 shorter; m^1 and m^2 shorter and broader (m^2 broader in middle).

Ursus orgilos sp. nov.

Type No. 180280 (rather old), U. S. Nat. Mus., Biological Survey Coll. From Bartlett Bay, east side Glacier Bay, southeastern Alaska. August 22, 1912. A. Hasselborg.

Cranial characters.—Size medium; skull long, rather narrow, low, flat on top, slightly dished. Rostrum normal or rather small; nasasl nearly horizontal, slightly decurved (not uplifted) anteriorly, slightly ascending posteriorly into frontal shield; shield rather narrow, flat, concave between orbits, acute pointed posteriorly; postorbital processes long, slender, outstanding, slightly decurved and recurved (posteriorly); braincase long and low; squamosal shelves long; zygomata moderately spreading and strongly outbowed, the broadest part more anterior than usual; sagittal crest straight and nearly horizontal; palate long and rather narrow; postpalatal shelf long and flat; jugal broad anteriorly, rising well above lachrymal duct; lachrymal duct opening within orbit; occipito-sphenoid long (90 mm.); lower jaw long. Teeth of medium or rather small size.

Remarks.—The sex of the type skull is not known. Assuming it to be a female, its male, or one closely related, is No. 98101 U. S. Nat. Mus., Biological Survey Coll., male ad., presented to me at Sitka in 1899 by Governor Brady of Alaska. This latter skull is considerably larger, has much larger canines, but slightly smaller upper molars. The two skulls are closely similar in general form and characters except that in the male No. 98101 the posterior frontal region is a little more elevated, the frontal shield more strongly concave between orbits, the postorbital processes heavier (broader) and more decurved.

Ursus innuitus sp. nov.

Type No. 179780 ♂ old, U. S. Nat. Mus., Biological Survey Coll. From Golofnin Bay, south side of Seward Peninsula, northern Alaska. Collected in 1886 by Edward F. Ball.

Cranial characters.—Size large, basal length essentially same as in *horribilis* and *alexandrae* but occipito-nasal length much less, owing to shortness of occiput; fronto-nasal region strikingly dished; rostrum short, exceedingly broad (of same breadth as in *alexandrae*, very much broader than in *horribilis*), strongly depressed; frontal shield exceedingly broad interorbitally, rising high and abruptly from rostrum, nearly horizontal behind plane of postorbital processes, rather deeply sulcate medially and strongly swollen over orbits; postorbital processes large, subtriangular, outstanding and decurved; nasals nearly horizontal; palate and postpalatal shelf broad; zygomata broadly spreading and outbowed posteriorly, acute anteriorly; nares broader than high; sagittal crest high posteriorly; lambdoid crest large and full; coronoid blade narrow and high; ramus long and flat. Canines badly broken, apparently long; last lower premolar broad, broader posteriorly than anteriorly, the cusp small and sloping posteriorly without heel or marginal cusplets, but with narrow sulcus; molars exceptionally large and broad, the last upper one with heel strikingly long and broad—agreeing almost exactly with that of true *horribilis* from eastern Montana.

Remarks—*Ursus innuitus* appears to be related to *horribilis* although their ranges are separated by an interval of about 2000 miles. Ignoring minor differences, *innuitus* differs from *horribilis* rather strikingly in the low short flattish and exceedingly broad rostrum, abruptly ascending frontal shield, and truncate occiput. The teeth, as above stated, are strikingly alike.

Ursus internationalis sp. nov.

Type ♂ adult, No. 1763 Ottawa Museum. Killed on Alaska-Yukon Boundary about 50 miles south of Arctic Coast (lat. 69° 00′ 30″), July 3, 1912, by Frederick Lambart of the Canadian Boundary Survey.

Skull similar to that of *phæonyx* but shorter; frontal shield more deeply and broadly sulcate (sides of sulcus rising very gradually); postorbital processes thicker and more decurved; orbital rims more elevated (almost everted); sagittal crest lower and more sloping (probably higher and more horizontal in advanced age); palate and postpalatal shelf *much shorter;* postpalatal notch not truncate; occipito-sphenoid length decidedly less (84 against 96). Last lower premolar conical and much smaller, lacking heel and without trace of posterior sulcus or marginal cusplets (in *phæonyx*, heel, sulcus, and posterior cusplets well developed); 1st lower molar swollen; middle lower molar swollen and convex on inner side.

Ursus russelli sp. nov.

Type No. 21301 ♂ old, University of Iowa Museum, collected on the Mackenzie Delta June 28, 1894, by Frank Russell. (Mounted skin with skull separate.)

Characters.—Size rather small. Color a curious pale drab brown, somewhat darker on legs and feet; ears conspicuously hairy. Claws smooth, moderately to strongly curved; brownish horn color with paler (almost amber) tips.

Cranial characters.—Skull of medium size, about equaling old males of *alascensis;* rather short; fairly broad across zygomata; frontal shield sloping strongly upward, moderately sulcate, swollen over orbits but orbits not everted; posterior point of shield rather short, ending about one-third the distance from fronto-parietal suture to postorbital processes; postorbital processes peg-like, standing out nearly horizontally—not depressed as in *alascensis;* muzzle rather narrow and high; zygomata slender, the posterior roots not expanded vertically; palate flat—not excavated or arched as in several species; lower jaw massive, heavier under second and third molars than in *alascensis ;* coronoid blade falcate but not narrowly so.

From its neighbor on the east, *Ursus richardsoni*, to which it may prove more nearly related than to any other species, and with the larger specimens of which it agrees in size and in certain dental characters, it differs in much more highly vaulted cranium; more highly sloping (less horizontal) braincase; much more elevated frontal region, and *very much narrower rostrum.* The frontal shield is much longer than in *richardsoni*, the temporal impressions curving backward to meet one another about ⅓ the distance between postorbital processes and fronto-parietal suture, instead of turning abruptly inward; postorbital processes more slender than in *richardsoni ;* sagittal crest shorter and less horizontal; upper molars very much larger, particularly broader. The zygomatic arches are bowed outward in both species—not sharply angular as in many of the large bears.

Ursus stikeenensis sp. nov.

Type from Tatletney Lake, near head of Skeena River, northern British Columbia. No. 202794 ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Sept. 23, 1913, by Chas. R. Cross, Jr., and E. A. Preble. Orig. No. 5772.

Characters.—Size medium; skull short and broad; claws short and strongly curved for a Grizzly (longest 60 mm.—tips worn by digging), dark, marked with yellowish on tips and sides. Upper molars large. Total length before skinning 1830 mm.; hind foot 267 mm.; estimated height at shoulder 39 inches (990 mm.).

Color.—General ground color dark brown, grizzled and washed with pale tipped hairs. Muzzle pale brown, becoming darker between eyes and on sides of face; top of head in front of ears washed with yellowish brown—almost forming a golden brown band between the darker ungrizzled frontal region and the more whitish color of the neck; general ground color of body very dark, bountifully overlaid on neck and back by pale buffy-tipped hairs which give a whitish cast to the neck; ears dark; legs and feet blackish; under parts dark brown; hairs on sides of throat long and grizzly.

Cranial characters.—Size medium; skull short, broad, highly arched, strongly dished, with abruptly ascending frontals and large molar teeth. Muzzle short, broad, broadening and strongly ascending posteriorly; nasals strongly upturned posteriorly; frontal shield rather broad, rising abruptly and swollen in front of and above orbits, sulcate medially, short-pointed, the point ending in sagittal crest about 30 mm. anterior to fronto-parietal suture; postorbital processes large, broad, subtriangular, and decurved, braincase long for size of skull; zygomata rather broadly spreading and slightly outbowed; palate and postpalatal shelf broad. Molars large and broad.

Male adult stikeenensis compared with male adult absarokus (apparently its nearest relative): size nearly the same though *absarokus* appears the larger; basal length and frontal breadth approximately same, but occipitonasal length much greater in *absarokus*. In *stikeenensis* rostrum lower, flatter, and more horizontal; frontal shield and posterior part of nasals rising much more abruptly; frontals much more swollen in front of orbits; point of shield much shorter (ending midway between plane of postorbitals and fronto-parietal suture, while in *absarokus* it reaches posteriorly to suture); inion short; palate broader; lower jaw shorter; coronoid lower.

Ursus nortoni* sp. nov.

Type No. 178763 ♀ adult, U. S. Nat. Mus., Biological Survey Collection. From Yakutat, Alaska. May, 1910. G. Frederick Norton. Original No. A5 (mother of ♂ cub No. 178764).

Characters.—Belongs to the Grizzly group; related to *stikeenensis*. Size medium; coloration pale; skull broad and massive.

Cranial characters.—Skull large, broad, with moderately spreading rounded zygomata, broadly expanded squamosal shelf, broad frontal region, and moderately dished fronto-nasal area. Frontal shield broad and long, its lyrate point reaching back to middle of parietals; postorbital processes large and broadly outspreading; rostrum broad, short, and somewhat depressed; palate and postpalatal shelf broad; occiput broad, low, truncate. Incisors large; canines and molars rather small for size of skull. Skull of adult male unknown.

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* Named in honor of G. Frederick Norton, who collected the type specimen and presented it to the Biological Survey.

Ursus imperator sp. nov.

Type from Yellowstone National Park, Wyoming. No. 176297 ♂ old, U. S. Nat. Mus. (Died in National Zoological Park.)

Cranial characters.—Size large (slightly larger than *absarokus*); skull of old male (the type) massive, moderately arched, strongly dished, with exceedingly short frontal shield, long and high sagittal crest, and long peg-like outstanding postorbital processes. Muzzle short, narrow for so large a skull, somewhat compressed below nasals; nasals nearly horizontal; frontal shield rising strongly just in front of orbits, flattish, shallowly sulcate medially, ending in short obtuse point about 30 mm. behind plane of postorbitals; postorbitals long, peg-like, horizontally outstanding; braincase long; lachrymal duct opening on orbital rim; zygomata moderately outstanding and outbowed, the squamosal base broadly expanded; squamosal shelves broad, arched over meatus; palate moderate; postpalatal shelf long; occipito-sphenoid 91 mm.; mastoids short; lower jaw large, long, and massive, with high vertical coronoid blade. Teeth large.

Old male imperator (the type) compared with old male absarokus (No. 2893 U. S. Nat. Mus.): Size larger; frontal shield broader; postorbital processes longer and more widely outstanding; rostrum higher and more horizontal (in *absarokus* lower anteriorly and more sloping); sagittal crest longer, its free edge nearly straight instead of arched; squamosal root of zygoma very much more expanded vertically; palate much longer; lower jaw longer and more massive.

Compared with old male stikeenensis (No. 171049): Much larger and more massive; frontal shield flatter; squamosal base of zygoma very much more broadly expanded; palate and postpalatal shelf much longer; lower jaw much longer; coronoid blade much higher and more vertical.

Old female *imperator* (No. 177660 U. S. Nat. Mus., Biological Survey Coll., collected near Lake Hotel, Yellowstone National Park, July 20, 1911, by Dr. P. S. Kellogg): Size large; zygomata moderately spreading, only slightly outbowed; braincase rather short, broadly rounded, without tendency to "keeling"; frontal shield rather broad, flattish, slightly convex laterally, slightly sulcate medially, its sub-lyrate point reaching fronto-parietal suture; postorbital processes rather large and short, outstanding, blunt or subtriangular, decurved; fronto-nasal region somewhat dished; rostrum broad, high, and rather short; lachrymal duct cutting orbital rim; squamosal arm of zygoma moderately expanded, the anterior root strongly swollen under front of orbit; sagittal crest moderate, nearly covering parietal; occiput obliquely truncate; inion moderate; palate broad; occipito-sphenoid about 80 mm.; under jaw large and massive. Teeth large, much as in female *absarokus* but upper molars broader; canines and molars much larger than in female *Ursus shoshone*.

Old female imperator (No. 177660) compared with old female stikeenensis (No. 180981): Skulls surprisingly alike in size, general form, and proportions. In *imperator* posterior frontal region less elevated; postorbital processes shorter; squamosal base of zygoma much more expanded vertically—differences that seem trivial by comparison with those that characterize the male skulls.

Old female imperator compared with adult female absarokus (from head Big Porcupine Creek, Montana, No. 13245 U. S. Nat. Mus.): Size essentially same; nasals more horizontal; fronto-nasal region much more dished; frontal shield much broader; postorbital processes much more massive; squamosal root of zygoma broadly expanded [in *absarokus* not expanded]; palate much broader; upper molars broader.

Ursus absarokus * sp. nov.

Type No. 67391 ♂ ad., U. S. Nat. Mus., Biological Survey Coll. From head of Little Bighorn River, northern part of Bighorn Mts., Montana. Purchased for the Biological Survey in May, 1893, by J. Alden Loring.

Characters.—Size large, but much less than *horribilis* and with much smaller molars—especially m^2. External characters unknown.

Skull of male (type specimen).—Vault of cranium rather highly arched; zygomata moderately outspreading and somewhat bowed; frontal shield of moderate breadth, rising strongly from ascending rostrum, convex at and behind plane of postorbital processes, swollen on each side of median line just behind plane of orbits; postorbital processes large, outstanding, and slightly decurved, the tips bluntly rounded; sagittal crest nearly straight, highest posteriorly, reaching anteriorly to fronto-parietal suture; postpalatal shelf broad and flat; nasals large; nares normal or rather small for size of skull; rostrum high, of moderate length and breadth, rising strongly into frontal shield; top of coronoid broadly rounded, its apex short, not reaching posteriorly to plane of condyle. Teeth rather large, especially m^2 which is long and broad, the heel emarginate on outer side.

Skull of female (No. 13245 U. S. Nat. Mus. From head of Big Porcupine Creek [not Porcupine River] between Musselshell and Yellowstone Rivers, eastern Montana).—Of generalized Grizzly type; large and rather massive; vault of cranium rather flat; braincase rather broad; frontal shield of moderate breadth, slightly convex, slightly depressed or sulcate between orbits, elongate-lyrate posteriorly; postorbital processes weak and slightly decurved; sagittal crest not yet reaching fronto-parietal suture; muzzle moderate or rather short; zygomata moderately spreading and rather angular; palate rather narrow. Teeth large; m^2 large and subrectangular.

Ursus tahltanicus sp. nov.

Type No. 179928 ♂ old, U. S. Nat. Mus., Biological Survey Coll. From Klappan Creek (=3d So. Fk. Stikine River), British Columbia. Collected and presented by G. Frederick Norton.

Characters.—Size medium (skull of male slightly smaller than male *stikeenensis* and *canadensis;* skull of female about same size as female *stikeenensis*, decidedly larger than female *canadensis*). Color of type specimen black (head absent, but entire body and legs almost coal black, lightly grizzled on anterior part of back by tips of golden-brownish).

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* Named for the Absaroka or Crow tribe of Indians, in whose territory they occur.

Cranial characters.—Adult and old males: Rostrum rather narrow (in old age compressed in front of orbits); vault of cranium low, flattish; frontal shield of moderate breadth, flat or depressed (sometimes sulcate medially), rather short-pointed, sloping gradually to plane of muzzle, and only slightly dished in fronto-nasal region; postorbital processes peg-like, horizontally outstanding; sagittal crest low, reaching forward about halfway (in extreme age a little more than halfway) from inion to postorbitals; zygomata broadly spreading and bowed; palate of median breadth; postpalatal shelf broad and flat (in type, an aged skull, less broad); squamosal shelves broad; squamosal root of zygoma not vertically expanded; infrajugal process of maxillary rather strongly developed; lower jaw short—much shorter than in *stikeenensis*, *shoshone*, and *canadensis ;* its ramus not flattened. Teeth rather small: canines and molars much smaller than in *stikeenensis*.

Skull of female relatively large (about same length as female *stikeenensis* but much narrower; much larger than female *shoshone* and *canadensis ;* vault of cranium moderately elevated, with tendency to fronto-parietal hump; facial part of skull large and long; frontal shield long, rather narrow, lyre-shape posteriorly, meeting sagittal crest some distance posterior to fronto-parietal suture; fronto-nasal region well dished; palate and postpalatal shelf long; zygomata moderately spreading and conspicuously outbowed; under jaw long.

Young females are best told by the teeth, especially the lower canines. In *tahltanicus* the lower canines are shorter and more slender than those of *stikeenensis*. In the latter species they are longer and thicker—especially thick in middle.

Ursus toklat sp. nov.

Type No. 158813 ♀ ad., U. S. Nat. Mus., Biological Survey Coll. From head of Toklat River, north base of Alaska Range near Mt. McKinley. Collected May 24, 1908, by Charles Sheldon and by him presented to the Biological Survey. Orig. No. 324. Mother of cub No. 158814 (Orig. No. 325).

Characters.—Size medium; color variable, the upper parts ranging from ordinary "grizzly bear color" to creamy white; claws horny and smooth, usually dark throughout but in many cases more or less marked with white. Skull of both male and female rather highly arched and dished, that of female much smaller and lower than male and more strongly dished. Last upper molar large; heel very long.

Cranial characters of adult males.—Size medium; rostrum high, subterete above, nearly horizontal; frontal shield abruptly elevated, swollen over orbits, sulcate medially, rather long pointed (reaching fronto-parietal suture); postorbital processes rather small and strongly decurved; squamosal shelves short; palate arched and excavated longitudinally; zygomata very *broadly spreading* and angular (zygomatic breadth in proportion to basal length much greater than in any other true Grizzly, about equalling that of *Ursus sheldoni*); sagittal crest short. Last upper molar large, its heel normally very long.

Cranial characters of adult females.—Skull rather long and narrow, with broadly spreading zygomata and strongly dished fronto-nasal region; frontal shield rather flat, becoming flatter with advancing age, sulcate between orbits, varying from lyre-pointed to short-pointed; postorbital processes outstanding horizontally; rostrum nearly horizontal. In most specimens the highest point of the cranium culminates in a rather abrupt change of angle at or near the fronto-parietal suture, forming a sort of "hump," a condition usual also in skulls of female Grizzlies from the Upper Yukon and northern British Columbia.

Old male toklat compared with old male alascensis: frontal region more elevated; sagittal crest shorter; zygomatic breadth *much greater;* heel of last upper molar *much longer.*

Old male toklat compared with old male phaeonyx: length about the same; zygomatic breadth very *much greater*, particularly with reference to basal length; frontals *much more highly arched;* sagittal crest shorter and lower; last upper molar larger—the *heel much longer.*

Adult female toklat compared with that of alascensis: size decidedly smaller; vault of cranium decidedly lower, highest over posterior part of frontals instead of over middle of frontals; frontal shield narrow, flattened, sloping (not arched and not materially swollen over orbits); postorbital processes outstanding horizontally; fronto-nasal region *strongly dished;* palate, post-palatal shelf, and occipito-sphenoid shorter; m^2 with *heel much longer.*

Adult female toklat compared with adult female phaeonyx: size decidedly greater; teeth much larger, especially the canines and last upper molars.

Ursus phaeonyx latifrons subsp. nov.

Type ♂ old, No. 75612 U. S. Nat. Mus., Biol. Survey Coll. Collected at Jasper House, Alberta, Sept. 15, 1895, by J. Alden Loring (original No. 3270).

Characters.—Size medium; skull moderately arched and moderately dished; base of skull elongate posteriorly; frontal shield very broad (interorbitally 93; between postorbital processes 130), rising from rostrum rather abruptly, broadly sulcate medially, convex over orbits; postorbital processes rather large and outspreading, slightly decurved; orbital rims thickened; rostrum rather high, nearly horizontal, its upper surface rounded (subterete); zygomata moderately spreading and broadly outbowed, the squamosal part moderately expanded vertically; palate 175 mm., postpalatal shelf broad; postpalatal length 145; occipito-sphenoid 89; sagittal crest well developed; lower jaw as a whole, and inferior border of ramus long; coronoid moderately falcate. Teeth of moderate size (very badly worn in type skull).

Compared with phaeonyx.—Size and general characters essentially same, but frontal shield broader; postorbital processes much larger and more outstanding; base of cranium longer (postpalatal length and occipitosphenoid slightly greater); outer side of zygomata straighter (less bowed); meatus tube longer; lower jaw longer; angle and condyle more elevated.

Ursus shoshone sp. nov.

Type from Estes Park, Rocky Mts. of northern Colorado. No. 203185 ♂ old, U. S. Nat. Mus., Biological Survey Coll. Purchased.

Characters.—Size medium or rather large, but much smaller than *horribilis* and *bairdi*—about same size as *absarokus* but narrower and widely different. External characters unknown.

Cranial characters.—Skull rather long and high, with flattish long-sloping frontal shield continuing plane of rostrum to high point about midway between postorbitals and fronto-parietal suture; moderately spreading zygomata; anterior (frontal) part of braincase keeling into sagittal crest; sagittal crest long and high; lambdoid crest high; postorbital processes peg-like, outstanding, rather slender; nasal region slightly dished and sulcate in middle third (nasals dipping toward one another—may be individual); rostrum of moderate breadth, strongly ascending in plane of frontal shield; lachrymal duct on inner aspect of orbital rim.

Skull of adult female (from Ft. Fred Steele, Wyoming, No. 203761 U.S. Nat. Mus., Biol. Survey Coll.): Skull long, low, and rather slender; frontal shield narrow, long lyre-pointed posteriorly, flat interorbitally, slightly convex (transversely) from plane of postorbitals posteriorly; a slight depression on each frontal on inner (medial) side of postorbital process; postorbitals slender and outstanding; rostrum slender; sagittal crest short, reaching only half way from inion to fronto-parietal suture; lambdoid crest moderate; meatus tube short; apex of coronoid produced posteriorly, overhanging deep coronoid notch; ramus flat and light. Teeth rather small; upper molars relatively large; lower molars narrow.

Adult male shoshone compared with adult male horriaeus: Rostrum, nasals, and frontal shield more elevated and much more strongly ascending posteriorly (less flattened and less horizontal); lambdoid much more strongly developed.

Adult male shoshone compared with adult male absarokus: Frontal shield flat, rising gradually in long continuous slope to highest point, about 25 mm. anterior to fronto-parietal suture [in *absarokus* arched, strongly convex, and rising suddenly to highest point, immediately behind orbits]; postorbital processes more slender; fronto-nasal region only slightly dished; rostrum more slender; braincase narrower; breadth across squamosal shelves less.

Ursus shoshone canadensis subsp. nov.

Type from Moose Pass, near Mt. Robson, British Columbia. No. 174511 ♂ ad., U. S. Nat. Mus. Collected by N. Hollister and Charles D. Walcott, Jr., July 23, 1911. Orig. No. in Hollister catalogue 3792.

Characters (Type specimen).—Size medium; color brown, grizzled with buff; claws short for a Grizzly, rather thick, moderately curved, pale yellowish on upper surface and tips, brownish horn color on sides.

Color.—Muzzle very pale drab brown, changing to darker brown on head, face, and chin; darkest around ears; top of head, cheeks posteriorly,* ears, back and thighs washed with buffy whitish from abundance of buffy-tipped hairs; fore leg and lower part of hind leg and feet very dark (almost blackish brown); long hairs of throat and axillary region pale yellowish; of rest of under parts dark brown.

Cranial characters.—(Ad. male, the type) Similar in general to *shoshone* but vault of cranium lower, frontal shield less ascending, flatter, and equally short posteriorly; postorbital processes long, slender, slightly decurved; rostrum narrowing anteriorly (wedge shape); posterior half of nasals rising in same plane with frontal shield; sagittal crest long, high, and convex, reaching anteriorly about 40 mm. over frontals; frontal part of braincase keeling into crest as in *shoshone;* zygomata less outbowed; lower jaw longer; coronoid blade broader and shorter. Canines rather short and thick. Molars broad and rather short, materially broader and more massive than in *shoshone;* m^2 broadly subtriangular, the heel short and rounded posteriorly.

Ursus klamathensis sp. nov.

Type No. 178735 ♂ adult, U. S. Nat. Mus., Biological Survey Coll. From Beswick, near mouth of Shovel Creek, Klamath River, northeastern California. Collected and presented by Charles Farwell Edson.

Characters.—Size of male large; skull in general of the *shoshone* type, but larger and with heavier canines. Claws moderate, rather strongly curved, horn color washed with yellowish basally and with pale yellowish markings at tips; marked longitudinally with fine parallel striae. Skin characters unknown.

Curiously enough, *Ursus klamathensis* does not require close comparison with any of the other species inhabiting California, its only near relative being *Ursus shoshone* of the Rocky Mts. of Idaho. Female unknown.

Cranial characters.—Skull large and rather highly arched; highest on posterior part of frontals; rostrum long, high, and ascending in plane of frontal shield; fronto-nasal region elevated, scarcely if at all dished; sagittal crest long and well developed; frontal shield flat, sloping, and rather short-pointed; lachrymal duct opening on orbital rim (rather posteriorly than anteriorly); zygomata moderately spreading, not expanded posteriorly;† anterior (frontal) part of braincase "keeling" into sagittal crest; occiput produced posteriorly (overhang much greater than in *californicus*); squamosal shelves long and broad; palate rather flat; occipito-sphenoid length 89 mm.; basioccipital very broad anteriorly; mastoids vertical, short; lower jaw long; coronoid blade high; ramus exceptionally broad vertically. Canines large; molars moderate; last upper molar relatively small, the heel emarginate or obliquely truncate on outer side; middle lower molar with anterior moiety much larger than posterior.

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* The long whitish-tipped hairs of the old coat have fallen out on the cheeks and anterior part of head nearly to ears.

† An old skull of an ad. male (No. 16621 U. S. Nat. Mus.) from Baird on the lower McCloud River, Calif., has the posterior or squamosal part of the zygomata abruptly expanded.

Compared with an old male *shoshone* from North Fork Teton River, eastern Idaho (No. 93 Merriam Coll.): Similar in general form and proportions but larger (basilo-condylar length 350 contrasted with 335); vault of cranium somewhat higher; frontal shield broader and flatter; palatal length about the same; postpalatal length much greater (150 contrasted with 135); opening of lachrymal duct slightly more posterior; basioccipital anteriorly very much broader; lower jaw decidedly longer; ramus much broader vertically. Canines larger and longer; last upper molar shorter.

In size and characters *klamathensis* resembles *pervagor* of the coast region of British Columbia, but the two differ markedly in certain specific characters. Omitting details, in *klamathensis* the rostrum and frontal shield form a continuous slope; in *pervagor* the nasal region is dished; in *klamathensis* the ramus of lower jaw is broadly expanded vertically; in *pervagor* normal; in *klamathensis* the canines are large, the molars moderate; in *pervagor* both canines and molars are exceptionally small. In both the basioccipital is broad.

Contrasted with old male *henshawi* of the southern Sierra, male *klamathensis* may be distinguished at a glance by its much larger size, much higher vault of cranium, elevated fronto-nasal region, and continuously sloping frontal shield and rostrum—in striking contrast with the depressed and strongly dished fronto-nasal region of *henshawi*.

Compared with *Ursus californicus* from the coast region south of San Francisco Bay, the differences are marked in the skull and striking in the teeth. In *klamathensis* the vault of the cranium is lower posteriorly and higher anteriorly; the frontal shield flatter laterally; the rostrum shorter; the base of the cranium (occipito-sphenoid) decidedly shorter. The last upper and middle lower molars are widely different, the heel of m^2 in *californicus* large, long, and broad posteriorly, while in *klamathensis* it is small and emarginate on outer side; the anterior part of m_2 in *californicus* normal, while in *klamathensis* it is disproportionally large.

Ursus pervagor sp. nov.

Type from Pemberton Lake, British Columbia, in edge of humid coast strip, ♂ ad., No. 187887 U. S. Nat. Mus. (=No. 6510 Merriam Coll.). May, 1883. John Fannin.

Cranial characters.—Size large; skull of adult male long, rather narrow, highly arched, moderately dished; zygomata moderately spreading and outbowed; frontal slope gradual; frontal shield of moderate breadth, rather flat, rising gradually to halfway between plane of postorbital processes and fronto-parietal suture, slightly decurved posteriorly, shallowly sulcate medially, swelling on each side just behind plane of postorbitals; postorbital processes outstanding, thick, peg-like; postpalatal shelf broad and flat; frontal part of braincase elevated, supporting posterior part of frontal shield; palate long; squamosal shelf long; lachrymal duct opening on orbital side of orbital rim; mastoid processes long; interpterygoid fossa short and broad; lower jaw long; coronoid broad; ramus long and swollen on outer side. Teeth small, particularly the canines and lower molars.

Ursus caurinus sp. nov.

Type from Berners Bay, east side Lynn Canal, southeastern Alaska. ♀ ad., No. 176591 U. S. Nat. Mus., Biol. Survey Coll. Collected June 8, 1911, by A. Hasselborg.

Characters.—Size rather large; skull long and rather narrow; canines long, the lower ones massive; claws smoothly polished.

Color.—Upperparts yellowish buff; face and most of head pale brown or drab; ears, hump, and underparts conspicuously darker; legs and feet dark brown or brownish black.

Cranial characters.—Skull (both male and female) long and narrow, highly arched, moderately dished, frontal shield narrow, strongly ascending posteriorly; postorbital processes weak and decurved; frontal part of braincase elevated, forming an uplifted base for posterior part of frontal shield; palate long; postpalatal shelf rather narrow; squamosal shelf long; lachrymal duct opening within orbital rim; ramus of jaw vertically flattened and broad.

Compared with perragor: Frontal shield narrower; postpalatal shelf narrower; lower jaw and inferior border of ramus shorter; ramus flatter on outer side and broader vertically; coronoid blade narrower and more falcate. Upper canines longer; lower canines conspicuously longer and larger; lower molars longer; heel of large lower premolar sloping, without distinct posterior cusplets.

Ursus colusus sp. nov.

Type from Sacramento River, Calif. (probably from between Colusa and Sacramento). No. 3837 ♂ old, U. S. Nat. Mus. Collected by the Wilkes U. S. Exploring Expd. and marked "C. P. Ex. Ex. 6.16" (the numerals uncertain, there being indication of a figure in front of the first 6). The words "Grizzly Bear, Sacramento" are written on the right parietal in pencil.

Cranial characters.—Skull of old male large, long, and low—in general resembling largest skulls of *californicus* but having very much smaller teeth and differing in numerous cranial characters.

Compared with old male *californicus* from Monterey: fronto-nasal region and rostrum more depressed; postorbitals much smaller and less swollen; orbital rims less swollen; sagittal crest longer; squamosal base of zygoma less expanded; palate broader anteriorly; ramus much less broad vertically; dentition weaker and strikingly different. The canines are too badly broken to admit of satisfactory comparison, but obviously were smaller; the upper incisors and both upper and lower molars are very much smaller; the heel of m^2 small and strongly emarginate on outer side, of same size and approximately same form as in *klamathensis* but even more strongly constricted on outer side immediately behind second cusp; lower molars of same size as in *klamathensis* though the jaw is much longer.

Compared with *klamathensis:* postorbitals, length of sagittal crest, form of zygomata, and dentition essentially same; but skull longer; vault of cranium *much lower;* frontal shield narrower and much shorter; temporal beads much more strongly incurved; fronto-nasal region *dished* instead of elevated; rostrum *much lower*, more depressed, and more horizontal; ramus longer, less broad vertically; diastema much longer.

The skull of a young-adult female from San Jose Mission (No. 1143 Yale Museum) appears to be a not quite grown female of *Ursus colusus.* The last upper molar is short and subtriangular, the heel emarginate on outer side.

Ursus californicus tularensis subsp. nov.

Type from old Fort Tejon, Cañada de las Uvas, Tehachapi Mts., Calif. No. 3536 ♂ old, U. S. Nat. Mus. Collected by John Xantus.

Cranial characters.—Skull of adult and old males similar to *californicus* but smaller; base of cranium somewhat shorter; palate slightly shorter; occipito-nasal length decidedly less; braincase decidedly shorter; zygomatic breadth same or slightly greater—the skull as a whole relatively broader than in *californicus;* postpalatal shelf broader; lower jaw materially shorter; first upper molar decidedly smaller (both shorter and narrower); lower series of teeth smaller, m_1 and m_2 particularly smaller, much narrower and less massive; heel of last upper molar less broad than in *californicus.*

Adult male Tejon Grizzly compared with Ursus henshawi (the type) from the southern Sierra: skull larger and more massive; fronto-nasal region much less dished; rostrum larger, higher, and not depressed; zygomata more broadly spreading; postpalatal shelf broader; coronoid larger and less falcate; ramus broader vertically; last upper molar much larger, the heel long and broad posteriorly, contrasted with the short subtriangular heel of *henshawi.*

Females (adult and old) of the Tejon Grizzly are more easily distinguished than males from their nearest relative, *Ursus californicus.* The skull of the female is much more like the normal female Grizzly type, not resembling the males as does the female of *californicus.* *Compared with female californicus:* skull decidedly smaller; frontal shield behind plane of postorbital processes more elevated and convex—not depressed and concave as in *californicus;* point of shield longer and broader; orbital rims more swollen; sagittal crest shorter and lower; palate at least 10 mm. shorter; occipito-sphenoid about 10 mm. shorter; lower jaw smaller and lighter; last upper molar decidedly smaller. Normal m^2 subrectangular as in *californicus* [in *henshawi* subtriangular and small].

Ursus magister sp. nov.

Type No. 160155 ♂ old, U. S. Nat. Mus., Biological Survey Coll. From Los Biacitos, head of San Onofre Canyon, Santa Ana Mts., Southern California. August, 1900 or 1901. Killed and presented by Henry A. Stewart.

Characters.—Size of male, huge (estimated weight over 1400 pounds), largest of the known Grizzlies, considerably larger than *Ursus californicus* of the Monterey region, and even than *Ursus horribilis*, the great buffalo killing Grizzly of the Plains (only equalled by the largest *alexandrae* of Kenai Peninsula); sexual disparity great, skull of female hardly half the bulk of male; skull of male of rather a generalized type; not dished. Claws of old female from head of Trabuco Canyon, Santa Ana Mts., exceedingly long, strongly curved, mainly yellowish above.

Color.—(Old female from head of Trabuco Canyon): General color dusky or sooty all over except head and grizzling of back. Muzzle gray or mouse brown, palest above; top of head and neck very dark brown sparsely grizzled with pale tipped hairs; back dusky grizzled with grayish; legs and under parts wholly blackish.

Cranial characters.—Skull long, vault of cranium well arched, but not abruptly; rostrum long and high; fronto-nasal region elevated, in same plane with frontal shield and rostrum; frontal shield flattish but not flat, slightly sulcate medially and slightly swollen on each side between postorbital processes, the point reaching fronto-parietal suture; zygomata only moderately spreading, angular, the posterior root somewhat expanded and rising rather abruptly from plane of squamosal shelf; sagittal crest rather short; palate scooped out anteriorily, forming a basin-like depression surrounding the anterior palatine foramina; occipito-sphenoid length 103.5 mm. Teeth large and broad but by no means disproportionate to large size of skull; 1st upper molar broad; last upper molar absent, but from its alveolus and its form in the female, obviously broad, short, strongly triangular, the heel small, narrowed posteriorly, obliquely emarginate on outer side; 4th lower premolar broad, with rather short slightly sloping heel, narrow, imperfect sulcus, without posterior cusplets; 1st lower molar apparently normal (much worn in type specimen); middle lower molar absent in type specimen but apparently normal, judging from the female (in which, however, it is badly worn).

Skull of female of extreme age from Trabuco Canyon (No. 156594, U. S. Nat. Mus., Biological Survey Coll., killed Jan. 5, 1908, by Andrew Joplin and Edward Adkinson): Size small; rostrum short and depressed; fronto-nasal region strongly dished; frontal shield flattish, slightly sulcate interorbitally, short-pointed, beaded posteriorly by elevated temporal impressions, rising rather abruptly at orbits; sagittal crest long and nearly horizontal; palate and postpalatal shelf broad, flat posteriorly, concave anteriorly.

Measurements in flesh of old male (the type): Height at shoulder from flat of foot 4 ft. (=1220 mm.); total length, snout to tail 9½ ft.*

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* Apparently an error.

(=2900 mm.); sole of largest foot without claws: length 12 in. (=305 mm.); breadth 8 in. (=204 mm.). The old female from Trabuca Canyon measured in the flesh by Andrew Joplin, 6 ft. 3 in.

Ursus henshawi sp. nov.

Type from southern Sierra Nevada near Havilah, Kern Co., Calif. No. 15671 ♂ old, U. S. Nat. Mus. Collected in 1875 by Dr. J. T. Rothrock and Henry W. Henshaw.

Characters.—Size rather small—by far the smallest of the California Grizzlies; size and general cranial characters as in *horriaeus*, but fronto-nasal region strongly dished and rostrum strongly depressed. Last upper molar short and broad, the heel short and subtriangular. Skin characters unknown.

Cranial characters.—Skull long, narrow, and rather low, with narrowly spreading zygomata, gently sloping flat-concave frontal shield, massive and somewhat arched postorbital processes, swollen orbital rims, strongly depressed and dished fronto-nasal region, and low depressed rostrum.

Compared with an equally old male *horriaeus* (the type, from Coppermines, New Mexico): similar in general, but rostrum strongly depressed; nasals flattened and horizontal anteriorly; *fronto-nasal region strongly "dished"* (in *horriaeus* rather high and *not* dished); frontal shield strongly and broadly concave between orbits and between postorbital processes (only faintly sulcate in *horriaeus*); more strongly sloping anteriorly; postorbital processes shorter and blunter; orbital rims more prominent, relatively thin, somewhat everted, continuing to lachrymal notch—their prominence anteriorly due in part to presence of a broad sulcus in ascending arm of maxillary immediately in front of orbit; lachrymal duct opening in orbit posterior to orbital rim (in *horriaeus*, on or anterior to rim); anterior nares broader than high (contrary true in *horriaeus*); lambdoid crest higher; inion much shorter; occipital overhang much less; palate decidedly broader; interpterygoid canal shorter; basisphenoid more deeply excavated on each side of median line; exposed presphenoid longer (probably not constant); mastoid processes much longer and more divergent; anterior part of pterygoids more broadly expanded vertically and articulating with a like expansion of posterior arms of palatines (probably not constant). Upper molars decidedly broader (canines broken off).

Ursus nelsoni* sp. nov.

Type ♀ adult No. 99657 U. S. Nat. Mus., Biol. Survey Coll., from Colonia Garcia, Chihuahua, Mexico. Collected November 13, 1899, by H. A. Cluff.

Characters.—Size, smallest of the Grizzly Bears. General color, pale buffy yellowish, varying to grayish-white, grizzled from darker color of underfur. Specimens in worn pelage vary to yellowish-brown and even rusty. Hairs of throat and flanks longer than elsewhere; belly sparsely haired, lacking the thick underfur of upper parts.

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*Named in honor of E. W. Nelson, who secured a series for the U. S. Biological Survey.

Description of type specimen in fresh fall pelage.—Muzzle pale brown, much darker around eyes; top of head yellowish-buff; back grayish-brown, heavily overlaid with pale buffy-gray tips (color more buffy across the shoulders, more whitish-gray on the back); hump dark brown, small; rump grizzled grayish and brown, the light tipped hairs failing posteriorly and on the sides, the dark brown ground color passing into blackish-brown on thighs, legs, feet and tail; forelegs also blackish-brown; lips and point of chin yellowish-buff, followed by area of dark brown; underneck and underparts generally long haired and grizzled, the prevailing color yellowish-buff. Claws long, smooth, and moderately curved; brownish horn-color streaked with yellowish. Longest claw 56 mm. from upper base to tip (tip worn off).

Cranial characters.—Adult male: Skull small; similar in general form to *horriaeus*, but more wolf like; size of female *horriaeus*; rostrum strikingly narrow; frontal shield narrow and only faintly sulcate medially; temporal impressions not beaded [in *horriaeus* strongly beaded]; occipito-sphenoid length nearly as great as in *horriaeus*, but palatal and postpalatal lengths much less; posterior root of zygoma slender; postorbital processes more slender, less depressed, and more pointed than in *horriaeus*. Teeth uniformly smaller.

Ursus horriaeus texensis subsp. nov.

Type No. 203198 ♂ old, U. S. Nat. Mus., Biological Survey Collection. Killed in Davis Mts., Texas, November 2, 1890, by C. O. Finley and John Z. Means.

Characters.—Skull similar to *horriaeus* in size and general characters, but lower, flatter, more smoothly rounded, and broader across squamosals; frontal shield narrower and flatter; postorbital processes more slender and peg-like and more horizontally outstanding; orbital rims less swollen; rostrum smaller (shorter and more slender); fronto-nasal region even less dished; palate somewhat broader between molars, and deeply excavated between last molars (not excavated in *horriaeus*); interpterygoid canal shorter; inferior border of jaw (symphysis to subangular tubercle) much longer. Canines and molars smaller.

Ursus navaho sp. nov.

Type from near Ft. Defiance (Mollhausen), probably killed in Chusca Mts., northeastern Arizona. No. 3500 (skin No. 3571) U. S. Nat. Mus.

Characters.—Size small; skull short, broad, and moderately dished. Relationship apparently with *horriæus*.

Cranial characters.—(Type specimen—a badly damaged old male of which only the front part with zygomata and lower jaw remain): Skull short; zygomata broadly spreading and outbowed, the anterior root much swollen, posterior root not expanded; frontal shield flat, short-pointed; postorbital processes peg-like and outstanding; temporal impressions beaded with a fine bead; rostrum short and small; nares rather small and nearly vertical; lachrymal duct opening on orbital rim, but more in than out; palate broad for so small a skull; postpalatal shelf broad; coronoid blade high. Teeth small: m^1 very small; m^2 short, with broadly rounded heel (tooth nearly as broad posteriorly as in middle and anteriorly).

Skull of old female from Navaho Range, near Cromo, Colorado (Colorado Museum): Skull short, dished, with broadly spreading slightly bowed zygomata; truncate occiput, flattish shield, and slender widely outstanding postorbitals. Rostrum small, tapering, rising posteriorly into flat lyrate shield; postorbital processes long, slender, and directed forward as well as outward; braincase rather broad and depressed; palate concave; postpalatal shelf broad and flat. Teeth moderate: molars about same size as in male.

Old male navaho compared with old male horriæus (both types): Size somewhat less; rostrum and palate shorter; postorbital processes smaller and outstanding instead of decurved; zygomata more bowed and apparently more spreading; ramus shorter. Teeth smaller.

Old male navaho compared with old male horriæus and old male texensis (all types): Size somewhat less; rostrum and palate shorter; ramus of jaw shorter; molar teeth smaller; heel of last upper molar more broadly rounded posteriorly. The postorbital processes and zygomata are like those of *texensis*—the postorbitals small and outstanding, instead of decurved as in *horriæus;* the zygomata outbowed, instead of angular as in *horriæus.*

Old female navaho from Navaho Mts. compared with old female horriæus from mountains north of Silver City, New Mexico: Skull as a whole and rostrum shorter; occiput doubtless more truncate (that of old female *horriæus* sawed off); frontal shield shorter and more dished; postorbitals longer, more slender and directed anteriorly as well as outward; zygomata much more broadly spreading, more swollen at anterior base, and distinctly bowed, instead of angular; palate broader, flat instead of concave; lower jaw thicker and heavier.

Ursus bairdi sp. nov.

Type from Blue River, Summit Co., Colorado. ♂ old, No. 203805 U. S. Nat. Mus. Biological Survey Coll. (= 3147 Warren Collection).

Characters.—Size large—in the Rocky Mt. region exceeded only by *horribilis;* skull long, with narrow elevated fronto-nasal region; claws of moderate length, smooth.

Color.—(Male young-adult from Bearlodge, Sundance National Forest, Cook Co., eastern Wyoming. Killed February, 1887, by Paul Kleineidam): Muzzle pale brown (apparently old pelage); head and face blackish, becoming slightly grizzled posteriorly and on lower part of cheeks by wash of yellowish-brown tipped hairs; entire body, legs and feet very dark brown overlaid on back by wash of light tips. Claws of moderate length, strongly curved, smoothly polished, dark horn color marked toward tips with pale yellowish, and most of them with whitish (superficially) on upper side of basal half.

Cranial characters of old male (type, from Blue River, Colorado; and a closely similar old male from Sabille Hole, Laramie Co., southeast Wyoming, a little north of Cheyenne).—Size large; fronto-nasal region high and rather narrow; rostrum rather long, narrow and *strongly compressed* in front of orbits; face long-sloping; frontal shield flat, short-pointed, slightly sulcate or depressed medially; shield and nasals in essentially same plane except that anterior third of nasals is slightly upturned; postorbital processes large, outstanding, and blunt; orbital rims prominent; sagittal crest long, high posteriorly; temporal impressions short, incurved, beaded; zygomata strongly outbowed, squarely spreading posteriorly; lachrymal duct slightly notching orbital rim (not squarely on rim as in most skulls from the region); squamosal shelf short, arched over meatus, the free edge thickened or everted; palate and postpalatal shelf moderate, rather narrow for so large a skull; mastoids long, divergent. Molars usually rather large.

Immature males of *bairdi*, up to at least the 5th or 6th year, have rather narrow convex frontal shields with weak decurved postorbital processes, and may be recognized at once by the form of the fronto-nasal region, which is *high, narrow and strongly pinched in* immediately in front of the orbits.

Old male bairdi compared with old male horribilis: Size somewhat smaller; frontal shield flatter and slightly narrower; fronto-nasal region elevated (never dished or sulcate between orbits); base of rostrum much more compressed laterally in front of orbits; palate shorter and narrower; mastoids longer and more divergent; meatus tube broadly rounded and free (not compressed between mastoid and glenoid); lower jaw as a whole shorter; ramus more swollen on outer side under m_2 and m_3; inferior border of ramus shorter and less upturned. Teeth smaller: m^1 and m^2 together 62 instead of 66; m^2 less massive.

Ursus utahensis sp. nov.

Type No. 180193 ♂ old, U. S. Nat. Mus., Biological Survey Coll. From North Fork Salina Creek, 10 or 12 miles southeast of Mayfield, Utah. Collected May 22, 1911, by Mart Martenson.

Characters.—Size large; coloration apparently normal. Skull long, narrow, and high, but not arched; fronto-nasal region high and very narrow—strongly pinched in.

Color.—(Of skin of head of male killed on Pine Valley Mt., southwest Utah. Obtained from Forest Ranger September 24, 1907, by Clarence Birdseye. Orig. No. 989): Muzzle pale brown; face and throat, except pale lip edgings and long hairs of median line of throat, dark brown, becoming grizzled posteriorly; top of head very dark, grizzled posteriorly by brown-tipped hairs.

Cranial characters of male ad.—Size large; skull very long and narrow; zygomata moderately spreading; frontal shield narrow, flattened, falling away on the sides immediately in front of orbits, leaving a high naso-frontal ridge; sagittal crest long and high, reaching anteriorly nearly to midway between fronto-parietal suture and plane of postorbital processes; postorbital processes very long, slender, peg-like, and horizontally extended; rostrum long, high, rather narrow and strongly compressed below the nasals; palate and postpalatal shelf exceedingly long; postpalatal notch narrow; interpterygoid fossa exceptionally deep; basisphenoid strongly concave; underjaw very long, ramus flat and *exceedingly broad vertically;* upper and lower molariform series of medium or rather small size; middle lower molar decidedly narrow.

An imperfect skull of an old male (No. 167390) from Pine Valley Mt., southwest Utah, differs from the type in having still smaller teeth both above and below, the molars, 4th premolar, and canines being but little larger than those of the female from the type locality.

The old male type of *utahensis*, compared with adult and old males of *bairdi* (the only neighboring species of approximately the same size), differs as follows: Rostrum longer and decidedly narrower; base of rostrum in front of orbits more compressed; postorbital processes longer and more slender; palate longer; postpalatal shelf narrower; interpterygoid canal much deeper; ramus of jaw longer, decidedly broader (vertically), flatter, and much thinner under 2d and 3d molars; upper molariform teeth, middle lower molar, and lower canine much smaller.

Cranial characters of female: An adult female (No. 180207) from the type locality is similar in general characters to the male, but much smaller and somewhat less extreme. Skull long and narrow; frontals and fronto-nasal region essentially same but sagittal crest shorter; zygomata relatively as well as actually much narrower (much less spreading) and not outbowed; rostrum narrowest anteriorly; molars smaller; canines much smaller.

Ursus kennerleyi sp. nov.

Type from mountains near Los Nogales, Sonora. ♂ old, skull No. 2086; skin No. 1047 U. S. Nat. Mus. Collected June, 1855, by Dr. C. B. Kennerly.

Characters.—Size rather small; skull long, narrow and high, but not much arched; rostrum narrow and high, in same plane with shield; fronto-nasal region strongly elevated, making a convexity slightly above otherwise continuous plane of rostrum and frontal shield; rostrum and naso-frontal region sub-terete, constricted (but not strongly pinched in) in front of orbits; nares much higher than broad; frontal shield flat, rather short-pointed posteriorly, passing into sagittal crest about $\frac{1}{3}$ distance from fronto-parietal suture to postorbitals; postorbital processes long, rather slender, outstanding and slightly decurved; frontal part of braincase elevated; zygomata moderately spreading and outbowed; palate long, somewhat concave; squamosal shelves broad; coronoid broadly falcate; ramus flat and broad vertically. Teeth of medium size (badly worn).

Remarks.—*Ursus kennerleyi* is a strongly marked member of the *bairdi-utahensis* group. It is most nearly related to *utahensis* but very much smaller and with teeth of about the same size. The skull, though an old male, agrees in size (length) with that of female *utahensis*.

Ursus shirasi sp. nov.

Type No. 203030 ♂ old, U. S. Nat. Museum, Biol. Survey Collection. Killed September 16, 1913, at Pybus Bay, Admiralty Island, by George Shiras 4th, and presented to Biological Survey.

Characters.—Size large (somewhat larger than the largest *Ursus sitkensis*); head highly arched; color black, except muzzle, which is dull brown; claws dark blue-black, dull, slightly scurfy (not smoothly polished as in the Grizzlies), rather strongly curved and of moderate length (middle claw over curve 92 mm., from top of base to apex 75 mm.), 4th and 5th rounded off on outer side.

Cranial characters.—Skull large, broad, massive, and highly arched; zygomata large, broadly outbowed and rounded (not angular) anteriorly as well as posteriorly; frontal shield remarkably short and broad (nearly twice as broad as long), deeply and broadly sulcate, with huge uplifted broadly outstanding postorbital processes which arch over the orbits and are strongly decurved apically, completely roofing the orbits; temporal ridges beaded, short, meeting far forward (at least 25 mm. in front of fronto-parietal suture); sagittal crest long and high, humped over fronto-parietal suture, thickened posteriorly; fronto-nasal region dished; rostrum broad and short, sloping strongly upward to meet frontal shield; post-palatal shelf long; basioccipital and basisphenoid subequal; infrajugal process of maxillary obsolescent; coronoid blade broad; ramus strongly bellied under posterior molar.

Dentition.—Heavy; canines large, the upper 47 mm. high above enamel line of outer side; pm$_4$ with tiny cusplet on inner side posteriorly; molars large and rather broad; m^2 with large and broad heel; m$_1$ with strongly developed cusplet on inner side of saddle.

Color.—Entire animal except muzzle *coal black*, showing when examined closely a brownish wash along middle of back; muzzle from nose pad to between eyes dull brown.

Remarks.—*Ursus shirasi* is a very large member of the Brown Bear group. Whether or not it is always black, like the type specimen, is not known. But of all the American bears its skull is the most striking and distinctive. The short broad frontal shield rising on each side into huge postorbital processes which arch broadly over the orbits serve to distinguish it at a glance from all other species, rendering close comparisons unnecessary. In this connection it is interesting to observe that *shirasi* and its neighbor *culophus*, an inhabitant of the same island, present opposite extremes of departure from the normal ursine type—*culophus* having a long narrow skull with slender elongate rostrum, long and narrow frontal shield, and insignificant postorbital processes, while *shirasi* has an exceptionally broad skull with broad short rostrum, excessively broad and short frontal shield, and huge massive postorbital processes.

Ursus kidderi tundrensis subsp. nov.

Type No. 76470 ♂ adult, U. S. Nat. Mus., Biological Survey Coll. From Shaktolik River, Norton Sound, Alaska. Collected by natives September, 1894, and secured through Rudolf Neuman, late Agent of the Alaska Commercial Co. at Iliuliuk, Unalaska.

Characters.—Size small, agreeing in this respect with *kidderi;* skull rather long and heavy; frontals broad and flat, broadly but not deeply sulcate medially; postorbital processes small; coronoid blade falcate and rather high. Similar to *kidderi* in essential cranial and dental characters, but differing in having the frontal shield and postorbital processes *very much broader and flatter*, and the frontal sulcus less marked. As in *kidderi*, there is little difference in the sexes except that the females have narrower muzzles, and narrower frontal shields. A young male (No. 76465) from Andreafski on the lower Yukon, collected by E. W. Nelson, has somewhat shorter canines than the others.

From *alascensis*, the Grizzly of the same general region, skulls of *tundrensis* (adult males in both cases) may be distinguished by the following characters: size larger (basilar and occipito-nasal lengths fully an inch greater); skull as a whole much more massive; frontals broader, rising less abruptly from facial plane, less swollen over orbits; rostrum less slender; palate more flat; ramus of jaw thicker under 2d and 3d molars; coronoid blade more falcate; canines larger, decidedly longer, and somewhat less curved; molars decidedly larger

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW AMELANCHIER FROM SOUTHEASTERN CALIFORNIA.

BY PAUL C. STANDLEY.

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Most of the service-berries of the western United States are characterized by pubescent foliage and inflorescence. Several species, however, are almost or quite glabrous, among them being *Amelanchier alnifolia* Nutt. and *A. polycarpa* Greene, two plants which range through the mountains and foothills of the Rocky Mountain region. In 1891 Doctor Greene described* a completely glabrous plant, *Amelanchier glabra*, from the Donner Lake region of California. Recently the writer had occasion to segregate the specimens of this species in the U. S. National Herbarium. Only two were found, one from the type region (*A. A. Heller* No. 7176) and one from Plumas County, California (*Mrs. Ames*), both of which agree very well with the type and with several other specimens in Doctor Greene's herbarium. In Coulter's New Manual of Rocky Mountain Botany (p. 266) Prof. Aven Nelson reports this species as occurring "from southern Colorado to the Sierra Nevada" and cites as a synonym *Amelanchier polycarpa* Greene, a species described from southern Colorado. To the writer it seems that *A. polycarpa* is distinct from *A. glabra*, and probably also from *A. alnifolia*, to which it is certainly closely related.

Besides the two collections referable to *Amelanchier glabra* there is only one other glabrous Californian specimen in the National Herbarium, this being one collected in the Panamint Mountains of the southeastern part of the State, by the Death

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* Flora Franciscana, p. 52.

Valley Expedition. It is so clearly distinct from any other western species that the writer does not hesitate to propose it as new.

Amelanchier covillei Standley, sp. nov.

Branches very stout, brownish red, glabrous; petioles stout, 3 to 10 mm. long; leaf blades oblong-orbicular to rounded-oval or rarely obovate-orbicular, 12 to 20 mm. long, 8 to 17 mm. wide, usually pointed at the apex and obtuse or sometimes rounded, obtuse or broadly rounded at the base, rather finely but irregularly crenate-serrate, the teeth apiculate, subcoriaceous, pale green and somewhat glaucous on the upper surface, paler green beneath, glabrous; racemes glabrous, rather densely few-flowered; pedicels 2 to 12 mm. long; ovary and calyx glabrous, the calyx lobes triangular-subulate, 2.5 mm. long; petals obovate-oblong, rounded at the apex, 5 to 6 mm. long, 2 to 2.5 mm. wide; fruit not seen.

Type in the U. S. National Herbarium, No. 47,165, collected in Cottonwood Canyon, Panamint Mountains, California, May 27, 1891, by Frederick V. Coville and Frederick Funston (Death Valley Expedition No. 962).

This is related to *Amelanchier glabra* and *A. alnifolia*, but the petals are only half as long as in those species. The leaves are usually pointed, rather than broadly rounded or truncate, as in *A. glabra*, thicker and relatively narrower, while the petals are proportionally broader. *Amelanchier alnifolia*, likewise, has much broader, larger, thinner, and brighter green leaves than *A. covillei*.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SNAKE FROM NORTHERN BRAZIL.

BY THOMAS BARBOUR.

While recently examining the specimens of the genus *Elapomorphus* preserved in the Museum of Comparative Zoology, I found a single specimen which I am unable to identify with any of the species of the genus hitherto described. It may be distinguished at once by its striking type of coloration and by its extremely small number of ventral scales. It may be known as

Elapomorphus nuchalis sp. nov.

Type, a single specimen from Villa Bella on the Amazon River, above Santarem, Brazil, Mus. Comp. Zool. No. 1164, collected and presented by Rev. J. C. Fletcher in 1863.

Rostral a little broader than deep, just visible from above; internasals much shorter than the praefrontals, not over one-third their length; frontal once and a half times as long as broad, a little longer than its distance from the end of the snout, much shorter than the parietals, which are about once and a half times as long as broad; one prae- and two postoculars; temporals 1 plus 2; 7 upper labials, third and fourth entering the orbit; 4 lower labials in contact with the anterior chin shields, which are much longer than the posterior. Scales in 15 rows. Ventrals 147; anal divided; tail imperfect. Tawny brown above, finely dotted with darker; three very indistinct darker longitudinal lines which are just visible on the nape region disappear along the body and reappear upon the posterior extremity of the body and on the tail; tip of snout yellow, with small black spots; top of head from internasals to and including anterior two-thirds of parietals dark brown, posterior extremities of parietals and temporals included in an extension upward of the creamy white of the throat; these markings, however, do not meet above, but are separated by a narrow isthmus which connects a broad dark nuchal collar with the dark top of the head; nuchal collar not extending below the sides of the neck; bordered behind with cream color; lip region with two yellow spots, one on the first and second labials, the other on the fifth and sixth; edges of lower lip with four dark dots on each side, all other lower surfaces creamy white, immaculate.

Remarks.—I found this species labelled *E. blumii*, a form with which it is doubtless closely related. I may add here that specimens which seem to be undoubtedly *blumii* from Rio Janeiro and Mendez, on the Parahyba River, vary somewhat in that the parietals may, in fully adult individuals, be very nearly twice as long as broad, while in younger examples the parietals are shorter. I do not know whether this fact is to be accounted for by individual variation or by change during growth, but I suspect that the relation has but very little diagnostic value, although it has been emphasized by Boulenger, who uses it in his key (Cat. Sn. Brit. Mus., Vol. 3, 1896, p. 239).

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PROCEEDINGS
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ON SOME AUSTRALASIAN REPTILES.

BY THOMAS BARBOUR.

During the autumn of 1913 Dr. Hubert Lyman Clark accompanied the Carnegie Institution Expedition to Australia and to some of the islands in Torres Straits. The following list is based upon Clark's material. Most of the species are already recorded from the localities represented in this collection since the Rev. S. Macfarlane, long a missionary in the Torres Straits region, returned many collections to England which have frequently been mentioned by Guenther and Boulenger. The new python described in this paper is the more remarkable as coming from one of the Murray Islands, where collecting was extensively carried on by Macfarlane, and this find simply adds another instance to show how extremely fortuitous is all reptile collecting.

LIST OF SPECIES.

AMPHIBIA.

Rana papua Lesson.

Two young examples from Kuranda,* Queensland, collected September 6, 1913. I have compared them with specimens of *Rana papua* of the same size from Manokwari and Sorong, New Guinea, and with larger specimens from Jobi (Jappen) Island. I can find no characters which separate them.

Hyla coerulea (White).

Three finely preserved examples from Mer Island, Murray Islands, Torres Straits, agree with Var. A. of Boulenger (Cat. Batr. Sal., 1882, p. 384) in having no lateral spots and the light line along the tarsus very inconspicuous. Since Boulenger's specimens from the Murray Islands and Thursday Island also belong to this race, it may be that the form with lateral spots and a tarsal line occurs only on the Australian mainland and that only this unspotted form occurs on the islands, although it has been said to have been taken in Queensland as well. The limits—if limits there really be—of the ranges of these two color varieties are well worth the attention of Australian naturalists.

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* Kuranda, which will be mentioned several times, is a station twenty miles inland from Cairns, North Queensland, at an elevation of 2000 feet.

Hyla krefftii Guenther.

A single rather shrunken and hardened example also from Kuranda I have referred to this species. It seems to agree fairly well with the descriptions.

Uperolia marmorata Gray.

A young example from Kuranda may be referable to this species. However, it lacks the triangular dark spot between the eyes, the white spots on loin and back of thigh which Boulenger (Cat. Batr. Sal., 1882, p. 267) speaks of. Above it is olive, marbled or perhaps better vermiculated over all with darker.

OPHIDIA.

Liasis clarki sp. nov.

Type, an adult, No. 9600, Museum of Comparative Zoology, from Mer Island, Murray Islands, Torres Straits. Collected in October, 1913, by H. L. Clark.

This species may be distinguished at once from any of the described species of *Liasis* by its manner of combining the characters used by Boulenger (Cat. Snakes Brit. Mus., Vol. 1, 1893, p. 77) to separate groups I and II in his key to the species of this genus. Thus it has several small loreal shields and also a deeply and conspicuously pitted rostral. It also has two pairs of praefrontals.

Rostral broader than deep, slightly visible from above, deeply pitted; internasals a little longer than broad, about one-half the length of the major pair of praefrontals; the minor praefrontals are widely separated by the major praefrontals which also form a wide suture with the frontal; frontal about as broad as long, broader at its anterior than at its posterior end; much shorter than its distance from the end of the snout; two pairs of parietals, the anterior as wide as but much shorter than the posterior; five small loreal shields; two prae- and four postoculars; eleven upper labials, first, second and third deeply pitted, fourth and fifth pitted but less conspicuously so; sixth and seventh entering orbit; sixteen lower labials, seventh to ninth slightly and tenth to fifteenth very deeply pitted. Scales in 47 rows. Ventrals 317, anal single, subcaudals 116. More or less uniform brown above, yellowish below.

Liasis childreni Gray has been recorded by Boulenger from "Islands in Torres Straits," collected by Rev. S. Macfarlane, who as a matter of fact collected extensively in the Murray group. *Liasis olivaceus* Gray has also been recorded from Cornwallis Island taken by the same collector. There are probably several species upon some of the islands and among these forms some may have extremely restricted distributions. This Museum also possesses two examples of *childreni* which were purchased from E. Gerrard in London by Mr. A. Agassiz in 1877. They are also labelled as from "Islands in Torres Straits" and undoubtedly represent part of Macfarlane's collection. They represent a form but distantly related to this one which I now describe.

Dendrophis calligaster Guenther.

A fine example of this characteristic Papuan species emphasizes the close relation which all of the Torres Straits Islands bear to New Guinea. The fauna is strongly Papuan with most of the prominent Australian types lacking. This species is recorded from both Cornwallis and the Murray Islands by Boulenger (Cat. Snakes Brit. Mus., Vol. 2, 1894, p. 81).

Glyphodon tristis Guenther.

Clark caught three beautiful specimens of this snake on Mer Island of the Murray group. He remarks that it seemed tame and inoffensive when alive and that the natives held it in no dread. He was surprised to learn of its affinities. It has long been known from this and nearby localities.

Sauria.

Gymnodactylus pelagicus (Girard).

A single example of this wandering species was collected on Prince of Wales Island, Torres Straits, September 12, 1913.

Hemidactylus frenatus Duméril et Bibron.

Clark found this wide ranging species also at Mer Island, Murray Island, Torres Straits.

Lialis burtonii Gray.

A fine example similar to that described by Boulenger (Cat. Liz. Brit. Mus. Vol. 1, 1885, p. 248) as Var. D. This phase was represented in the British Museum by examples from Murray Islands and Cornwallis Island only. It is perhaps likely that it does not occur elsewhere.

Diporophora bilineata Gray.

Two from Prince of Wales Island, Torres Straits.

Gonyocephalus spinipes (A. Duméril).

An immature but beautifully preserved example from Kuranda, Queensland.

Amphibolurus muricatus (White).

One from Wentworth Falls, Blue Mts., New South Wales.

Leiolepisma cyanogaster (Lesson).

A beautiful example from Mer Island. It is apparently identical with specimens from New Guinea and New Britain.

Leiolepisma fuscum Duméril et Bibron.

This species is represented in the collection by specimens from Badu or Mulgrave Island, Mer Island and Darnley Island. I have also received it recently from Mossman in Queensland. These specimens differ constantly in coloration from the topotypes which I collected in Waigiu and from the many others from the Moluccas and Papua collected at the same time. Doubtless several distinct geographical races occur within this species, as in *Dasia smaragdina.*

Leiolepisma peronii (Duméril et Bibron).

A single example from Kuranda in Queensland.

Leiolepisma albertisii (Peters and Doria).

A beautifully preserved suite of twenty-seven specimens from Mer Island and one from Prince of Wales Island. The specimens from Mer Island are astonishingly unvarying in their color pattern. This stability of coloration in authentic specimens from the same locality has been impressed upon me more and more since my study of the living scincs at various localities in the Moluccas and Papua.

Homolepida crassicauda (A. Duméril).

A fine specimen from Darnley Island, Torres Straits, whence the species does not seem to have been recorded before. It is known from Murray and Cornwallis Islands.

Sphenomorphus quoyi (Duméril et Bibron).

A well preserved adult from Kuranda, Queensland.

Cryptoblepharus boutonii peronii (Cocteau).

The specimens before me from Darnley Island, Prince of Wales Island, and Mer Island seem to agree with this race and can not be differentiated *inter se.* Their coloration is distinctive and remarkably uniform. The various races of *boutonii* have sometimes very restricted and usually well defined ranges and within this species coloration is an extremely valuable diagnostic feature. It must be noted, however, that these little creatures are easily carried from place to place especially by aboriginal commerce or migration and that much of the old material in Museums is probably incorrectly labelled as to locality. Thus it becomes increasingly difficult to limit the ranges of the forms as commerce and intercommunication increase. This race, *peronii,* apparently occurs in Waigiu, Papua and the Torres Straits Islands, but I have had no specimens from the Australian mainland to compare with them. Roux records it also from Aru Islands.

In the Ké group its place is taken by the distinct race *keiensis* Roux, while on Bali and Lombok are found confined the races *balinensis* Barbour and *cursor* Barbour. Further exploration will doubtless reveal many others.

TESTUDINATA.

Chelonia japonica (Thunberg).

A young example from Mer Island but slightly larger than the one figured by Stejneger (Herp. Japan, 1907, p. 509) from the Bonin Islands, agrees well with his figure, as well as with those figured by Fry (Rec. Austr. Mus. 10, 1913, pl. 20) from Torres Straits. Fry uses the name *C. mydas* Linné and although unfortunately I have no young West Indian examples before me I feel that reason requires my using Thunberg's name. Young specimens from Penang and the coast of Bengal are very similar to the Mer specimen. I find that the young specimen from Penang (M. C. Z. 1413) captured by Captain W. H. A. Putnam of Salem is the one from which Garmen took the description of the young of his *C. depressa*, thereby making it a cotype of that species. This was the basis of Garman's remark that *depressa* occurred in the "East Indies and Australia." While this is possibly true, this record can not stand, since comparison with Fry's excellent description and figures in his recent redescription of *depressa* (l. c. p. 159–185 pl. 19–22) shows that the Penang specimen is a *Chelonia* of the *mydas-japonica* and not of the *depressa* type. It may be added that the adult type was purchased from Professor H. A. Ward and came from northern Australia, a fact now made known for the first time. It was probably procured by him during one of his trips to the Torres Straits region.

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A NEW RACE OF MICROTUS MONTANUS FROM THE CENTRAL SIERRA NEVADA.

BY JOSEPH GRINNELL.

(Contribution from the Museum of Vertebrate Zoology of the University of California.)

The *montanus* group of meadow mice occupies the northeastern section of California, in the Modoc region west to the vicinity of Mount Shasta, and thence south along the Sierra Nevada to and including the Mount Whitney region. A curious thing in its distribution is that in the northern part of this general area this specific type belongs to a lower life zone than in the southern part. The species appears to tip up zonally from north to south. Material accumulated in the California Museum of Vertebrate Zoology indicates that three subspecies are recognizable, and that typically these belong to three different levels of zonal position. The two extreme races have been named, and it remains to characterize and name the middle-lying form. But this new subspecies, of intermediate position, is not altogether intermediate in characters. Geographic variation in the *montanus* group of meadow mice has already been referred to briefly by Vernon Bailey (N. Amer. Fauna, No. 17, 1900, p. 28).

Microtus montanus yosemite new subspecies.

YOSEMITE MEADOW MOUSE.

Type.—Female adult, No. 12,978, Mus. Vert. Zool.; Yosemite Valley, 4000 feet altitude, Mariposa County, California: May 27, 1911; collected by J. and H. W. Grinnell; Orig. No. 675.

Diagnosis.—Similar to topotypes of *Microtus montanus montanus* (Peale), from Sisson, Siskiyou County, California, but coloration notably paler; less black, more gray. Black hairs dorsally less in proportion, buffy hairs paler, more grayish in tone; feet and tail less blackish, the latter more distinctly bicolor, dark brown above and dull whitish below; ears smaller than in *montanus* and more hairy.

Material.—Thirteen specimens: 2 (Nos. 11,947, 11,948) from Independence Lake, 7000 feet altitude, Nevada County, taken by A. M. Alexander and L. Kellogg; 7 (Nos. 19,309–19,315) from Cisco, 6000 feet altitude, Placer County, taken by J. Grinnell and F. H. Holden; 4 (Nos. 12,975–12,978) from Yosemite Valley, 4000 feet altitude, Mariposa County, taken by J. and H. W. Grinnell. All these localities are in high Transition or Canadian Zone, in the central Sierra Nevada of California, and the mice were trapped in wet meadows. The zonal range of *M. m. montanus*, of northern California, appears not to extend higher than low Transition, while that of *M. m. dutcheri* Bailey, of the high southern Sierras in the vicinity of Mount Whitney, extends from Canadian up through Hudsonian.

Measurements.—Of type (old adult female): Total length, 166 mm.; tail, 51; hind foot, 20; basilar length of hensel, 24.7; zygomatic width, 16.2; mastoid width, 12.2; length of nasals, 7.6; height of braincase at bullae, 9.7. Three old males, one from Yosemite and two from Independence Lake, measure, respectively: lengths, 185, 175, 177; tail, 46, 48, 43; hind foot, 21, 21, 21.

Comparisons.—The relatively gray cast of coloration as compared with *M. m. montanus*, obtains also when compared with *M. m. dutcheri*. The latter is much more reddish above, and usually has a buffy wash below, entirely lacking in the other two forms. In size and hairiness of ears *yosemite* is apparently intermediate between *montanus* and *dutcheri*, though the differences here involved are slight. In respect to cranium, *yosemite* as compared with *montanus* seems to have more widely spreading zygomatic arches and more angular braincase. While there seem to be other minor skull differences, there is not available a sufficient series to indicate fully the nature and range of individual and age variations.

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PROCEEDINGS

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NEW MAMMALS FROM COSTA RICA AND MEXICO.

BY N. HOLLISTER.

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The following hitherto undescribed forms of the red brocket and two-toed anteater have been found in the collection of the United States National Museum:

Mazama tema cerasina subsp. nov.

Type from Talamanca, Costa Rica. Skin and skull of young male (milk premolars still in place), U. S. National Museum No. $\frac{12206}{14206}$. Collected by Prof. W. M. Gabb. Orig. No. 54.

General characters.—A rich colored form of *Mazama tema*, differing from both *M. tema tema* of Mexico and *M. t. reperticia* Goldman of the Canal Zone in its considerably darker, more reddish, coloration.

Color of type specimen.—Above, from nose to withers, including most of outer sides of ears, dark blackish-brown; sides of muzzle, region around eyes, and hairs of crown tuft mixed with reddish. Entire upperparts and sides of body, fore limbs to knees, and outer sides of hind limbs to points of hock bright reddish-chestnut, almost Hay's russet of Ridgway, darkest on back and lighter and brighter on sides, hips, and limbs. Chin and throat warm buff, the chin crossed by a band of brownish; lower neck brownish; underparts of body like sides but lighter colored, without line of demarcation; inguinal region dark buffy, scantily haired. Lower fore and hind limbs dark brown, the feet reddish. Tail above like rump, below whitish.

Two skins of older animals from the type locality are virtually like the type, and three skins of adults from Guatemala are only slightly paler, clearly resembling *cerasina* more than they do Mexican specimens of *tema*.

Measurements.—Type, from dry skin: Head and body, 910 millimeters; hind foot, 235. Skull and teeth of type and of an older male from the type locality: Greatest length, 176, 191; condylobasal length, 167.5, 185; zygomatic breadth, 80.5, 82; length of nasals, 46.5, 55.6; anterior edge of orbit to tip of premaxillary bones, 82, 94; upper molar-premolar series, 58 (milk premolars in place), 54 (permanent premolars); width second upper molar, 11.3, 11.6; length of mandible, 139, 152; lower tooth row, 62 (with milk premolars), 59.5 (with permanent premolars).

Specimens examined.—Talamanca, Costa Rica, 5 skins and 4 skulls; La Palma, Costa Rica, 1 skull; Guatemala, 4 skins and skulls.

Remarks.—The Middle American brocket is more widely different from the Panama form than it is from the Mexican race. The young in spotted coat are particularly brighter red. There are, apparently, no characters to separate it from *M. tema tema* other than those of color. In some specimens of *cerasina* the hair is reversed in a line along the neck from the withers to crown; in others there is no indication of this character, which seems to be of little or no value in differentiating forms of these small deer.

Cyclopes mexicanus sp. nov.

Type from Tehuantepec, Oaxaca, Mexico. Skin and skull of adult, No. $\frac{11137}{38534}$, U. S. National Museum. Collected by Dr. Speer.

Characters.—Differs from *Cyclopes dorsalis* Gray and from all other forms of the genus in its clear ochraceous-yellow coloration; very little or no clouding from darker hair tips; underfur a much lighter tint of brown than in the related forms.

Color of type.—General color above and below ochraceous pale-orange-yellow, most intense and golden on head, shoulders, and withers which are decidedly glossy. A narrow, wavy line of brown from withers to lower back and a fainter brown line below from breast to belly; hair tips otherwise entirely unmarked. Underfur of forward parts of back mummy-brown; of lower back, sides, and underparts very pale brownish-drab; of tail not distinctly darker than tips.

Two specimens, from Tabasco and southern Vera Cruz, show slight marbling from darker hair tips on upper body.

Skull.—Not differing from skulls of *C. dorsalis* except that in a series of seven specimens the audital bullæ are uniformly larger, especially much broader, than in skulls of the Middle American species.

Measurements of type, from well made dry skin: Total length, 443 millimeters; tail, 242. Skull of type: Greatest length, 45.8; condylobasal length, 45.7; interorbital breadth, 9.6; breadth of braincase, 23.5; length of mandibular ramus, 29.7.

Specimens examined, 7, from Chiapas,* Oaxaca, Tabasco,* and extreme southern Vera Cruz.*

Remarks.—Compared with a series of six specimens of *Cyclopes dorsalis* from Middle America (Costa Rica, Honduras, and Guatemala) the series of Mexican *Cyclopes* is markedly different in coloration. There is no evidence of other than extreme constancy in color in specimens from the same region. The Middle American form is a very much darker golden-brown and is heavily marbled with darker hair tips, as in *C. didactylus*. It is, however, easily distinguishable from the South American species by its less grayish, more golden-yellow ground color, especially of the arms, legs and tail.

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* Biological Survey Collection.

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TWO NEW NORTH AMERICAN BATS.

BY GERRIT S. MILLER, JR.

Having recently examined the bats of the *Myotis lucifugus* group in the United States National Museum, including the large series of skins in the Biological Survey collection, I find two forms which have not yet been described. Both are races of the wide-ranging *Myotis longicrus* (True), an animal which proves to be specifically distinct from *M. lucifugus*.

Myotis longicrus interior subsp. nov.

Type.—Adult male (skin and skull), No. 133,426 U. S. National Museum (Biological Survey Collection). Collected five miles south of Twining, Taos County, New Mexico (altitude 11,300 feet), July 23, 1904, by Vernon Bailey. Original number 8182.

Characters.—Similar to *Myotis longicrus longicrus* but color essentially like that of *M. lucifugus* (type tawny-olive above, faintly lighter below), not darkened as in the northwest coast race; skull tending to be slightly larger than in true *longicrus* and with less abruptly rising frontal and occipital regions; teeth normal.

Measurements.—Type: head and body, 52; tail, 38; tibia, 18; foot, 8.4; forearm, 37; thumb, 7.4; third finger, 66; condylobasal length of skull (teeth moderately worn), 14.0; zygomatic breadth, 8.8; lachrymal breadth, 5.0; breadth of braincase, 7.4; occipital depth, 5.4; mandible, 10.2; maxillary toothrow, 5.2; mandibular toothrow, 5.7.

Specimens examined.—Thirty-five, from the following localities:

Nevada: Cottonwood Range, 1; Panaca, 1.

Idaho: Birch Creek, 1; Inkom, 1; Malad, 1; Mission, 1.

Wyoming: Geyser Basin, 1; Lake Fork, Wind River Mts., 1; Rattlesnake Mts., 1.

Colorado: Grand Junction, 1; Coventry, 1.

New Mexico: Costilla River, 2; Raton Range, 1; Santa Clara Canyon, 2; Santa Fé, 1; Sierra Grande, 2; Twining, 5; Willis, 2.

ARIZONA: Chiricahua Mts., 1; Fort Whipple, 1; Keam Canyon, 1; Little Spring, 2; San Francisco Mountain, 2.

CHIHUAHUA: Colonia Garcia, 1; San Francisco Canyon, 1.

Remarks.—Various specimens from the interior of California (three of them from the southern part of the State kindly placed at my disposal by Dr. Joseph Grinnell) have the color characters of *Myotis longicrus interior.* Whether or not they are strictly referable to this race is a question which can not for the present be decided.

Myotis longicrus amotus subsp. nov.

Type.—Adult female (skin and skull), No. 54,437 U. S. National Museum (Biological Survey Collection). Collected at Cofre de Perote, Vera Cruz, Mexico (altitude 12,500 feet), May 27, 1893, by E. W. Nelson. Original number, 4873.

Characters.—Externally like *Myotis longicrus interior* (only known specimen slightly darker and more red than in any of the specimens of the northern form yet seen, its color best described as a dark, reddish, tawny-olive); skull with palate narrowed and braincase reduced; teeth normal except that the upper canine is slightly more robust than in the other races, its diameter appreciably greater as compared with that of palate.

Measurements.—Type: head and body, 54; tail, 44; tibia, 18; foot, 8.6; forearm, 39; thumb, 6; third finger, 76; fifth finger, 55; condylobasal length of skull (teeth moderately worn), 13.8; zygomatic breadth, 8.8; lachrymal breadth, 5.0; breadth of braincase, 7.0; occipital depth, 5.2; mandible, 10.2; maxillary toothrow, 5.2; mandibular toothrow, 5.8.

Specimen examined.—The type.

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PROCEEDINGS

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AN APPARENTLY NEW SPOROPHILA FROM ECUADOR.

BY J. H. RILEY.

[By permission of the Secretary of the Smithsonian Institution.]

In a small collection of birds from Ecuador presented to the U. S. National Museum by Mr. Otto Holstein, of San Antonio, Texas, there is an apparently unnamed *Sporophila*. It may be known as:

Sporophila incerta sp. nov.

Type, U. S. National Museum, No. 236586 (unsexed but apparently a male), Gualia, Ecuador.

Characters.—Similar to *Sporophila grisea* Gmelin, but larger, darker above, and with the white below more restricted.

Description.—Above deep neutral gray, darker on the head and cheeks; throat, upper breast, and flanks neutral gray, much lighter on the chin; middle of the breast and belly white, the feathers gray at the base; under tail-coverts white with gray bases to the feathers, the longer ones with a buffy tinge at the tips; wings blackish, the feathers edged with deep neutral gray; fourth to eighth primaries white at the base of the outer web, forming a speculum; inner webs of the primaries and secondaries commencing with the third primary, bordered with white at the base; bend of the wing below deep neutral gray; under wing-coverts white; tail blackish. Wing, 66; tail, 44.5: culmen, 11.5; tarsus, 15.5; middle toe, 12 mm.

Remarks.—Five specimens of *Sporophila grisea* (mostly unsexed, but apparently males) from Venezuela (1), Trinidad (1), and Columbia (3), average as follows: wing, 57; tail, 45.6; culmen, 10.5; tarsus, 15.7; middle toe, 11.5 mm. I can find no record for *Sporophila grisea* from Ecuador and while the relationship of the above described specimen would probably be better expressed by a trinomial, I prefer for the present to use a binomial.

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GENERAL NOTES.

THE SYSTEMATIC NAME OF THE BRAZILIAN CRAB-EATING RACCOON.

The name *Procyon cancrivorus brasiliensis* Von Ihering (Revista do Museu Paulista, Vol. 8, p. 228, 1911) applied to the crab-eating raccoon of Brazil, is antedated by *P[rocyon] nigripes* Mivart (Proc. Zool. Soc. London, 1885, p. 347). The latter name has been generally overlooked. It is based on the black-footed crab-eating raccoon of Sclater (Proc. Zool. Soc. London, 1875, p. 421) from "Brazil down to Paraguay." It is clear from Von Ihering's account that his name refers to the same subspecies, which should, therefore, be known as *Procyon cancrivorus nigripes* Mivart. —*N. Hollister.*

THE GENERIC NAME OF THE COLLARED PECCARIES.

When selecting* the species *labiatus* as type of the genus *Dicotyles* I overlooked the fact that the species *torquatus* had already been formally chosen.† On account of this earlier selection the collared peccaries must take the generic name *Dicotyles* Cuvier, 1817, with *Pecari* Reichenbach, 1835, as a synonym. The name *Tayassu* Fischer, 1814, with *Notophorus* Fischer, 1817, and *Olidosus* Merriam, 1901, as synonyms, will remain in use for the white-lipped group. —*Gerrit S. Miller, Jr.*

THE TECHNICAL NAMES OF THE COMMON SKUNK AND MINK OF THE EASTERN STATES.

The name *Viverra nigra* Peale and Beauvois, 1796 (Scientific and Descriptive Catalogue of Peale's Museum, p. 37), type locality Maryland, antedates *Mephitis putida* Boitard, 1842, for the common skunk of the eastern United States. In a like manner *Mustela mink* Peale and Beauvois (l. c., p. 39), type locality Maryland, has precedence over *Mustela lutreocephala* Harlan, 1825, for the common mink of the middle and eastern States. These two forms‡ should be called *Mephitis nigra* and *Mustela vison mink.* —*N. Hollister.*

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* List of North American Land Mammals in the United States National Museum, 1911, p. 384. December 31, 1912.

† Palmer, Index Gen. Mamm., p. 930. January 23, 1904.

‡ See Howell, North Amer. Fauna, No. 20. p. 25, 1901; and Hollister, Proc. U. S. Nat. Mus., Vol. 44, p. 473, 1913.

THE GENERIC NAME OF THE COMMON FLYING-SQUIRRELS.

The generic name *Sciuropterus* F. Cuvier, 1825, in current use for the common palearctic and American flying squirrels, must, according to the international code, give place to *Pteromys* G. Cuvier, 1800. While *Sciuropterus* contained the species *volans* (*Sciurus volans* Linnaeus=*Pteromys russicus* Tiedemann) only, *Pteromys* included the same animal and *Sciurus petaurista* Gmelin, the latter type by tautonymy of the genus *Petaurista* Link, 1795. In 1826* F. Cuvier selected the species *petaurista* as the type of *Pteromys*, thus apparently making the name a synonym of *Petaurista*. Six years previously, however, Fleming† had chosen *volans* as type, a fact hitherto overlooked.

—*Gerrit S. Miller, Jr.*

ON THE SYSTEMATIC NAMES OF THE CHEETAHS.

In a recent paper on the nomenclature of the cheetahs, Dr. Max Hilzheimer‡ proposes serious changes from the conclusions on this subject which I presented in 1911§. These changes I believe to be entirely erroneous, and they should not be passed unnoticed.

The plan to transfer the name *Felis jubata* Schreber to the Indian cheetah, on the basis of the color and markings of the exceedingly inaccurate picture (plate 105) in Schreber's work, in preference to my method of fixing the type locality from the excellent text, is surely not defensible. The plate in question is barely identifiable as to genus, much less species or subspecies. The name *Felis guttata* Hermann, which I threw out as indeterminable, is, I believe, better left so. Whether the basis for the name be taken from Hermann's brief text or from Hammer's description the name can not be fixed on a cheetah. The plate in Schreber (105 b), even if it could be allowed to have weight in the determination of Hermann's name, is colored so unlike any cheetah that the name would still be better left out of the question. The name must, however, rest on the original publication, where it either refers to a serval or else is indeterminable.

Great stress is laid by Hilzheimer on the fact that I made no use of the name "*Acinonyx guepard,*" of Brookes, which Hilzheimer, without having seen the original reference, considers the type of the genus *Acinonyx*. *Acinonyx* is a valid name only on page 16 of Brookes' Catalogue and includes only the single species *Acinonyx venator* of India, which is thus the type of the genus by monotypy. On page 33, as cited in quotation by Palmer, who had not at that time seen the work, *Acinonyx* is used in connection with *A. guepard* and *A. venator*, but all are *nomina nuda*. Not being a valid name, *guepard* did not receive consideration in my paper.

The earliest valid names for African and Indian cheetahs should, I believe, remain just as I stated in 1911, *jubatus* Schreber and *venaticus* Smith, respectively.

—*N. Hollister.*

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* Dict. Sci. Nat., Vol. 44, p. 40.

† Philos. of Zool., Vol. 2, p. 190.

‡ Sitz-ber. Ges. nat. Fr., Berlin, 1913, pp. 283–292.

§ Proc. Biol. Soc. Washington, Vol. 24, pp. 225–226, 1911.

TADARIDA RAFINESQUE VERSUS NYCTINOMUS GEOFFROY.

In 1814, on page 55 of Précis des Déconvertes somiologiques ou zoologiques et botaniques, Rafinesque wrote: "Je viens de m'apercevoir que Mr. Geoffroy St. Hilaire a établi en 1810, le G. [enre] *Cephalotes* avec le *Pteropus pal*[*l*]*asii* et une autre espèce *C. peronii;* mais nos caractères diffèrent en ce que dans mon *C. teniotis* [see page 12 of the Précis] il n'y a ancune [sic] incisive inférieure: [a gross misstatement of fact] s'il compose un G. [enre] particulier, il faudra le nommer TADARIDA TENIOTIS." So far as I have been able to find this use of *Tadarida* is the earliest name that has been applied to the bats long known as *Nyctinomus*.

Nyctinomus is usually considered to have been first published by E. Geoffroy in the second volume of the natural history of the Description de l'Égypte, pages 114 and 128, the only species mentioned being *Nyctinomus aegyptiacus.* The date on the title page of this volume is 1812. Sherborn (Proc. Zool. Soc. London, 1897, pp. 285–288) concludes that the volume did not appear until 1818, four years later than Rafinesque's little work. Sherborn advances his opinion with excellent arguments which seem beyond refutation. Among other interesting things he shows that Gray had received a set of proofs of Geoffroy's paper presumably later than March, 1813. Geoffroy probably sent proofs to other zoologists of his time. At any rate in 1816, Oken (Lehrbuch Naturgesch, pt. 3, vol. 2, p. 924) uses *Nyctinomus* in the same sense as did Geoffroy, as well as the genera *Plecotus*, *Stenoderma*, *Rhinopoma*, *Taphozous* and *Myopterus*, names usually accredited to Geoffroy in 1818, but which should stand on the authority of Oken, 1816.

That Geoffroy's names were not published before 1816 or 1817, seems to be made certain by an examination of pages 125 to 130 of volume 1 of Cuvier's Règne Animal, 1817 (actually appearing late in the previous year). Five of Geoffroy's six new genera of bats in the Description de l'Égypte are mentioned there: Les Nyctinomes. (Geoff.) p. 125; Les Sténodermes. (Geoff.) p. 125; Les Rhynopomes. (Geoff.) p. 128; Les Taphiens. (*Thaphozous*, Geoff.); Les Oreillards. (*Plecotus*. Geoff.). The last two are the only ones in which the generic names occur in Latin form. Plate references in the Description de l'Égypte are given by Cuvier. On those plates the names appear as French words only. No page or volume numbers of the "Description" are given, but with respect to most of the names that were in use before the appearance of the Règne Animal Cuvier gives volume and page references. The inference is that the plates of the mammals of the Description de l'Égypte were in existence before the text.

Unless the above conclusions can be shown to be founded in error the bats currently called *Nyctinomus* should in the future be designated by Rafinesque's name *Tadarida*.

Blainville (Compt. Rend. Acad. Sci. Paris, vol. 5, p. 821, 1837), and Gray (Ann. Mag. Nat. Hist. ser. 3, vol. 17, p. 93, 1866) used *Tadarida* in the same sense as did Rafinesque. Gervais in 1855 (in Castelnau Expéd. Amér. Sud. Mamm. p. 60) refers to *Tadarida* as one of Rafinesque's genera, but without mention of place or date of publication.

The type of *Nyctinomus* Oken, 1816, Geoffroy, 1818, is *aegyptiacus*, a species with four lower incisors; the type of *Tadarida* Rafinesque is *teniotis*; a species with six lower incisors. Recent workers (Miller, Bull. U. S. Nat. Mus. No. 57, p. 251, 1907) do not consider these differences of generic value.

—*M. W. Lyon, Jr.*

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INTERESTING MAMMALS ON THE PRIBILOF ISLANDS.

On February 14, 1914, a polar bear was seen and shot at by an Aleut at Zapadni Rookery, St. George Island. The tracks were seen on shore in the snow by the writer and others. This animal was formerly an abundant inhabitant of the northern part of Bering Sea, but rarely came south of St. Matthew Island. If native reports are to be believed, it has been seen on St. Paul Island on at least three different occasions, but this was many years ago. From the same source of information comes the only previous record of the animal on St. George. This was about 1820, when a bear came ashore from the ice pack at the village and went westward to a small pond where it spent some time on the ice. Thereafter this has been known as Bear Lake. The numerous tracks along the beach in the snow show that the bear seen at Zapadni had been ashore also. During the winter no drift ice had been sighted from the island. But this could not have been seen unless it had come within ten miles. Hair seals had been common about the beaches but in no unusual numbers.

During the month of March, 1914, walruses were sighted three different times swimming along just off shore. They were at no very remote time abundant on St. George as the skulls may yet be seen about the beaches. Five dead ones floated in at Garden Cove about 1907.

A sperm whale or cachelot came ashore at Zapadni Rookery April 14, 1914. It was a male 47 feet long and had probably been dead a week. About five tons of the blubber were saved for fox food when the head and carcass floated away. Although other species of whales are abundant about the island, the cachelot had never been seen before by any of the Aleuts.

—*G. Dallas Hanna.*

THE SPOTTED TIGER-CAT IN TEXAS.*

In his report on the mammals of the Emory survey of the United States and Mexican boundary, Baird recorded three specimens of *Felis pardalis*, two of which were from Eagle Pass, Texas. These same three skins were listed in the Mammals of North America, 1857, and are still preserved, in excellent condition, in the collection of the United States National Museum. One Eagle Pass skin, number 25, received from Col. S. Cooper, proves to be not an ocelot, however, but a cat of the *Felis wiedii* group, not heretofore recorded north of Sinaloa, Mexico. It differs from several skins of the Mexican representative of this group, *Felis glaucula* Thomas, in its much richer, less grayish color. The pelage is long and full and the spots are almost solid, with only slight indications of light centers. In general tone of coloration it resembles somewhat a Costa Rica specimen, probably referable to *Felis pirrensis* Goldman, which is also a member of the *wiedii* group. The hairs of the nape in this group of cats seem to be either reversed or normal in specimens of the same form. So little is known of the color variations in *Felis glaucula*, that in the absence of a skull with the Eagle Pass skin it would be unwise to treat the Texas form as distinct.

The record of a representative of this group of cats along the Rio Grande is of great interest, and possibly explains the "long-tailed yellow lynx" reported to Bailey from west of Corpus Christi in 1902.† Such a description fits the Eagle Pass specimen of tiger-cat much better than it does any heretofore known cat of Texas. —*N. Hollister.*

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* Published by permission of the Secretary of the Smithsonian Institution.

† North Amer. Fauna, No. 25, p. 169, 1905.

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Vol. XXVII, pp. 221-224 December 29, 1914

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE GENUS CHOISYA

BY PAUL C. STANDLEY

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The genus *Choisya* is a member of the Rutaceae, whose species, hitherto considered to number only two,* are confined to Mexico and the southwestern United States. One of them, *C. ternata*, occurs in central and southern Mexico, while the other, *C. dumosa*, has included plants of local occurrence in the low arid mountain ranges of northeastern Mexico, extreme western Texas, southern New Mexico, and southeastern Arizona.

The writer recently had occasion to determine a plant of this genus from the State of Coahuila, Mexico. It was obviously related to *Choisya dumosa*; but it came from a locality far removed from the previously known range of that species, and differentiating characters were at once apparent. Careful inspection of the material in the U. S. National Herbarium under cover of *C. dumosa* soon convinced the writer that there were here represented three distinct types, besides the one from Coahuila. The four species of the *dumosa* group to be described have widely separated ranges, so far as known, there being some uncertainty as to the locality from which one of them comes. All except one are known from incomplete material, and it is to be hoped that, when flowers and fruit of all have been collected, additional distinguishing characters may be found.

KEY TO THE SPECIES.

Leaflets 3, oblong to obovate, 5-30 mm. broad. . . . . . 1. *C. ternata*.
Leaflets linear, 1-4 mm. broad.
  Pubescence of the pedicels consisting of minute, appressed hairs.

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* Percy Wilson, N. Amer. Fl. **25**: 205. 1911.

Leaflets usually 3–5, rarely 6–7, commonly 2.7–5 cm. long; petioles one-third as long as the leaflets or shorter. . . . . 2. *C. arizonica.*

Leaflets usually 8–13, rarely 6 or 7, 1–4 cm. long; petioles always more than half as long as the leaflets, often equaling them. 3. *C. dumosa.*

Pubescence of the pedicels consisting of slender, spreading hairs.

Leaflets 3–5, 2–4 mm. wide, conspicuously broadest at or above the middle, the margins plane or nearly so, repand-denticulate. 4. *C. mollis.*

Leaflets usually 7–11, rarely 5, 1.3 mm. wide or narrower, of uniform width throughout, the margins strongly revolute, entire or nearly so. . . . . 5. *C. palmeri.*

1. **Choisya ternata** H. B. K. Nov. Gen. & Sp. **6**: 6. 1823.

Juliania caryophillata Llave & Lex. Nov. Veg. Descr. **2**: 4. 1825.
Choisya grandiflora Regel, Gartenfl. **25**: 257. 1876.

This is the type of the genus *Choisya*. In general appearance it is unlike *C. dumosa* and its allies, and there are slight differences in the flowers. For that reason Doctor Torrey formed a new genus, Astrophyllum, for the plant here called *Choisya dumosa*. Doctor Engler, in Natürlichen Pflanzenfamilien * maintained both genera, but Mr. Wilson † united them. Unfortunately the fruit of *Choisya ternata* is not known; when it is secured it may be found that the genus Astrophyllum is valid.

There are only two specimens of *C. ternata* in the U. S. National Herbarium, one from the Cerro de Matzize, Puebla, Mexico, and one collected by Schiede from cultivated plants. The two exhibit many differences in leaf form, but without ampler material it does not seem practicable to attempt a segregation.

2. **Choisya arizonica** Standley, sp. nov.

Branches blackish, the branchlets green, bearing numerous coarse elevated glands, densely pubescent with minute, closely appressed hairs; petioles stout, one-fifth to one-third as long as the leaflets, minutely appressed-pubescent; leaflets usually 3 or 5, rarely 6 or 7, linear, of nearly uniform width throughout, commonly 2.7–5 cm. long, 2–2.5 mm. wide, rounded or truncate at the apex, glabrous, or minutely appressed-pubescent on the upper surface, the margins slightly revolute, shallowly crenulate; pedicels 1.2–2 cm. long, minutely appressed-pubescent; sepals obtuse, ciliate and minutely and sparsely pubescent; petals 1 cm. long; style and ovary densely pubescent; fruit not known.

Type in the U. S. National Herbarium, no. 15,060, collected on limestone ledges of the Santa Rita Mountains, Arizona, at an altitude of 1350 meters, May 16, 1884, by C. G. Pringle. Also collected in the Mule Mountains, Arizona, July 20, 1894, by J. W. Toumey.

This appears to differ sufficiently from *C. dumosa* to receive specific recognition, the distinguishing marks being the few, elongate leaflets and very short petioles. The two Arizonian specimens are exactly alike, and come from a region considerably removed from that in which *C. dumosa* is known to occur.

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* 3^4: 125. 1896.

† N. Amer. Fl. **25**: 205. 1911.

3. **Choisya dumosa** (Torr.) A. Gray, Proc. Amer. Acad. **23**: 224. 1888.
Astrophyllum dumosum Torr. U. S. Expl. Miss. Pacif. **2**^{2}: 161. 1854.

Branchlets bearing numerous coarse, slightly elevated glands, densely pubescent with minute, mostly appressed hairs; petioles stout, densely glandular, always more than half as long as the leaflets and often equaling them; leaflets commonly 8–13, rarely 6 or 7, 1–3 or rarely 4 cm. long, of nearly uniform width throughout, glabrous, or sparsely pubescent with very minute, appressed hairs on the upper surface, the margins slightly revolute, remotely crenulate; sepals obtuse, truncate, or retuse, ciliate; petals 7–8 mm. long; capsule 6 mm. high, copiously pubescent with slender, appressed or slightly spreading hairs.

Guadalupe Mountains of western Texas (*V. Havard*, *Agnes Chase*), to southern New Mexico (San Andreas Mountains, *J. H. Gaut* 37, *Pope Exped.*, *E. O. Wooton*), and northern Chihuahua (*Bigelow*).

The specimens upon which this species was based were said to have come from the Organ Mountains, New Mexico; probably they came instead from the San Andreas Range, which lies just to the north of the Organs and is separated from them only by a high pass. Capt. Pope's expedition is known to have followed the road which leads over the pass.

The shrub is often abundant, but it is known to occur in only a few localities, in all of which conditions are similar. The Mexican name is given as *sorillo*, a term which is applied to other members of the family, as for instance, to a species of *Xanthoxylum* in Sinaloa and Tepic, Mexico.

4. **Choisya mollis** Standley, sp. nov.

Branchlets stout, bearing numerous low glands, densely pubescent with slender spreading hairs; petioles one-fifth to one-third as long as the leaflets, densely hirtellous; leaflets 3–5, 1.2–4 cm. long, 2–4 mm. wide, conspicuously widest at or above the middle, narrowed toward the base, rounded at the apex and often emarginate, densely hirtellous, the margins usually plane, broadly repand-denticulate, the lateral leaflets often much reduced; pedicels 1–1.5 cm. long, densely hirtellous; ovary densely hirsute; flowers and fruit not seen.

Type in the U. S. National Herbarium, no. 15,062, collected by the Mexican Boundary Survey, no. 146. On the same sheet are two branches of *C. dumosa*, distributed under the same number. According to the Botany of the Mexican Boundary Survey,* this number doubtless includes specimens from northern Chihuahua and others from the "western slope of the Sierra del Pajarito, Sonora." It is probable that the type of *C. mollis* is from the latter locality.

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* Page 42.

Although based upon scanty material, the proposed species seems distinct by reason of the few broad leaflets, with denticulate margins, and the longer, spreading pubescence.

5. **Choisya palmeri** Standley, sp. nov.

Branches stout, grayish or yellowish, the branchlets rather slender, densely short-hirtellous, bearing few, minute, scarcely elevated glands; petioles half as long as the leaflets or longer, often equaling them, finely hirtellous; leaflets usually 7–11, rarely 5, 6–17 mm. long, 1–1.3 mm. wide, of uniform width throughout, densely short-hirtellous, rounded at the apex, the margins strongly revolute, entire or nearly so; pedicels 1.2–2.3 cm. long, finely hirtellous; capsules 5–6 mm. high, copiously glandular, densely hirtellous; seeds 4–5 mm. long, dark brown, shining.

Type in the U. S. National Herbarium, no. 570,236, collected at Chojo Grande, 27 miles southeast of Saltillo, Coahuila, Mexico, July 16, 1905, by Dr. Edward Palmer (no. 715). Also collected on Pico de Teira, Zacatecas, May 17, 1908, by F. E. Lloyd (no. 223).

Amply distinct in the short, strongly revolute leaflets and the spreading pubescence. The glands are smaller and less conspicuous than in any other specimens examined.

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PROCEEDINGS

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A NEW BAT FROM CUBA.

BY GERRIT S. MILLER, JR.

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In February, 1902, Mr. William Palmer collected a bat of the genus *Chilonatalus* in a cave at Baracoa, eastern Cuba. This specimen I recorded two years later * as *Chilonatalus micropus*, though with some doubt as to its strict identity with the Jamaican form. During a recent visit to Washington, Mr. Charles T. Ramsden kindly placed at my disposal a second specimen of the same animal killed as it flew from a clump of cane near Guantanamo. On comparing these two individuals with four Jamaican *micropus* I find that the Cuban bat is a readily distinguishable local form.

Chilonatalus macer sp. nov.

Type.—Adult female (in alcohol), No. 113,724, U. S. National Museum. Collected at Baracoa, Cuba, February 6, 1902, by William Palmer. Original number 699.

Characters.—Like the Jamaican *Chilonatalus micropus* (Dobson) as regards general size and length of forearm (32 mm. in both Cuban specimens, 32-33 in three from Jamaica), but tibia longer (18 in both Cuban specimens, 15.5-16 in four from Jamaica); skull with braincase essentially as in *C. micropus* (breadth 6.0 and 6.2 in the Cuban specimens, 6.0 in two from Jamaica), but with rostrum more elongate (length from narrowest part of interorbital constriction 7.2 and 7.4 in the Cuban specimens, 6.6 in two from Jamaica).

Color.—In the Ramsden specimen (skin) the main color above is a dark cinnamon-buff moderately clouded by the dark brownish tips to the hairs; underparts clear, light pinkish-buff; membranes moderately dark brown. After nearly fifteen years' exposure to alcohol the color of the type appears to be essentially like that of the skin.

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* Proc. U. S. National Museum, vol. 27, p. 340. January 23, 1904.

Measurements.—Type and adult (not sexed) from Guantanamo: tibia, 18* and 18; foot, 8 and 7; forearm, 32 and 32; thumb, 4 and 4; condylobasal length of skull (teeth not worn in either specimen), 13.4 and 13.6; zygomatic breadth, 6.8 and 6.8; lachrymal breadth, 4.0 and 4.0; interorbital constriction, 2.8 and 2.6; breadth of braincase, 6.2 and 6.0; depth of braincase, 5.0 and 5.0; length of rostrum from narrowest part of interorbital constriction to tip of premaxillary, 7.2 and 7.4; mandible, 10.6 and 10.8; maxillary toothrow (exclusive of incisors), 6.0 and 6.0; mandibular toothrow (exclusive of incisors), 6.6 and 6.4.

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* Not 20.0 as recorded in Proc. U. S. Nat. Mus., vol. 27, p. 343.

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PROCEEDINGS

OF THE

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GENERAL NOTES.

PIPISTRELLUS IN MAINE.

Since so little is known regarding the occurrence of *Pipistrellus subflavus obscurus* in the northern portions of its range, the following notes from Maine may be of interest. The only published reference to the presence of this bat in the State, which has come to my notice, is that of Dr. J. A. Allen in his "Catalogue of the Mammals of Massachusetts."* He writes: "There are several specimens in the Museum of Comparative Zoölogy from Massachusetts, and others from Maine, the latter being at present its most northern known locality." The Maine specimens on which this statement was based appear to have been lost, and accordingly I am unable to cite the locality from which they came. Evidently the bat escaped observation again until August 18, 1900, when Mr. A. H. Norton of Portland took one in Windham. He secured two more in the neighboring town of Westbrook on September 15, 1903.

With one exception, the remaining specimens which I have examined were collected in Winthrop by Mr. A. S. Pope of Manchester on the following dates: August 28, 1909, June 1, 1912, July 1, 1913, June 27, 1914 (contained two large embryos), July 1, 1914. He has supplied me with a note on their habitat. "All my specimens were collected in one locality, Richard's Pond, Winthrop, over the water. I have never taken it around the buildings although I have collected ten or a dozen little brown bats (*Myotis*) there." Mr. Norton's specimens were also secured in the vicinity of water.

The localities referred to above lie in a tongue of the Transition zone which enters the southwestern part of the State, and it is here that we might expect the northern form of this typically Austral species to reach the limit of its range. It is particularly interesting, therefore, to record a specimen from a cave near Allagash Lake in Piscataquis Co., which is in the heart of the Canadian zone in Maine, and I believe, the most northern point from which the species has been taken. It was found September 9, 1913, in company with eleven little brown bats (*Myotis lucifugus*).

It is safe to conclude that *Pipistrellus* is common in the Transition area of the State, and further search may prove it to be a regular inhabitant of a portion of the Canadian zone.

—*Manton Copeland.*

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* Bull. Mus. Comp. Zoöl., 1869, No. 8, p. 208.

LICHTENSTEIN'S PLURAL DISTRIBUTIVE GENERIC NAMES BUBALIDES, CONNOCHAETES AND GAZELLAE.

In 1814 Lichtenstein (Mag. Ges. naturf. Freund. Berlin, vol. 6, p. 152 and following) in a monograph of the genus *Antilope* recognized 29 species in that genus and grouped them into 4 tribes: "*Bubalides*," with 8 species; "*Connochaetes*," with one species; "*Antilopae genuinae*," with 8 species, and *Gazellae* with 12 species, the names of the tribes being in plural distributive form. The names applied to two of the tribes have found their way into systematic zoology in the form of singular collective nouns as valid terms for well established genera of Ungulates, Lichtenstein being commonly cited as their authority. A third name, *Connochaetes*, is in current use, still in its plural form, for another genus. The fourth tribe designation, "*Antilopae genuinae*," having no semblance of a generic or subgeneric name has never entered nomenclature, though in analogy with *Gazella* and *Bubalis*, *Antilopa* might be construed as an emendation of the original and currently used *Antilope*. It seems curious that the singular spelling of *Connochaetes* does not appear to have been used by authors. Yet if sanction be given to *Bubalis* and *Gazella*, why not employ *Connochaeta* or *Connochaete?*

Although the assemblages of species in Lichtenstein's "Tribus" designated by plural distributive nouns are the equivalent of modern genera, the fact is that the currently used *Bubalis* and *Gazella* as singular collective nouns do not occur in Lichtenstein. They should accordingly take date and authorship from the first writer to use them as singular collective nouns applied to subgenera or genera. The case of *Connochaetes* is similar with the difference that subsequent writers using it seem to think it is in singular collective form. Consideration of each of Lichtenstein's mononomial terms and their subsequent use as singular collective nouns results as follows:

Bubalides Lichtenstein, 1814, is a plural distributive noun and as such is not the proper designation of a subgenus. The next use of this word is by Rafinesque as *Bubalis* (Analyse de la Nature, p. 56) in 1815. It is there a singular collective noun but stands without description or reference. The earliest use of *Bubalis* as a valid name and a collective word is apparently by Goldfuss in 1820 (Handb. Zool., vol. 2, p. 367). Here it occurs as [section or subgenus] "a" of the genus *Antilope* Pallas with the species "*A. bubalis* L. Vache de Barbarie. Menag. du Mus I, p. 346," type by tautonomy, and "*A. caama* Cuv. Hartebeest. Cerf du Cap. Schreb. t. 277." *Bubalis*, Frisch, 1775 (Syst. vierf. Thier., p. 2) should be ignored as being employed by a non-binary author (see Thomas and Miller, Ann. Mag. Nat. Hist., Ser. 7, vol. 16, p. 463, 1905).

Gazellae Lichtenstein, 1814, is not used as a singular collective noun and consequently can not be considered as the proper designation of a subgenus of antilopes. The first use of the word as a singular collective noun is by Rafinesque (Analyse de la Nature, p. 56), 1815, but like *Bubalis* it appears without description or reference. It was next employed by Blainville (Bull. Soc. Philom., 1816, p. 73) one year later as a subgenus of *Antilope*, adequately described, and with nine species: *dorcas*, *kevella*, *corinna*, *subgutturosa*, *euchore*, *pygara*, *koba*, *kob*, and *nasoma-*

culata. The type of Blainville's genus *Gazella* was selected by Ogilby in 1837 (Proc. Zool. Soc. London, vol. 4, p. 137) as *Antilope dorcas* and the subgenus itself was raised to generic rank.

Connochaetes of Lichtenstein, 1814, has the same criticisms against it as have *Gazellae* and *Bubalides*, but the word is not so obviously in plural distributive form. It has been adopted in its original spelling by most recent authors as the generic name of the gnus. According to the generally accepted rules the proper form of the word should be *Connochaeta* if admitted into nomenclature at all. Subsequent to Lichtenstein's distributive use of *Connochaetes*, no author appears to have used the word until Gray mentions it in 1843 (List Spec. Mamm. Brit. Mus., p. XXVI) spelled *Connochetes*. Meantime two other generic names had been proposed embracing the gnus, *Cemas*, Oken, 1816 (Lehrbuch Naturgesch., part 3, vol. 2, p. 727) and *Catablepas*, Gray, 1821 (London Medical Repository, vol. 15, p. 307), each with the same type, *Antilope gnu* Gmelin (See Sclater and Thomas, Book of Antelopes, vol. 1, p. 93, 1895). The singular collective *Cemas* should thus replace the plural distributive *Connochaetes*. This change is not far reaching because Gray in 1850 (Knowsley Menagerie, p. 20) proposed *Gorgon* as a subgenus of *Catablepas*. *Gorgon*, embracing all the gnus except the white-tailed gnu, has lately been raised to generic rank (Heller, Smiths. Misc. Coll., vol. 6, no. 8, pp. 3, 19; Roosevelt and Heller, Life Histories African Game Animals, p. 361, 1914). The white-tailed gnu would thus constitute the genus *Cemas*.

It is hoped the publication of this note will bring attention to generic and subgeneric names used in plural distributive form and perhaps lead to some uniformity in treating them. A few other plural generic names exist in mammalogy, but only Lichtenstein's three genera mentioned above are taken seriously, the others being properly ignored.

—*M. W. Lyon, Jr.*

FURTHER NOTE ON THE GENERIC NAME OF THE COLLARED PECCARIES.

Dr. J. A. Allen has kindly called my attention to the fact that my recent conclusion[*] regarding the generic name of the collared peccaries is incorrect. While it is true that Palmer in 1904 regarded the species *torquatus* as type of Cuvier's genus *Dicotyles*, Gray in 1868[†] had selected[‡] *labiatus* (Cuvier 1817 = *pecari* Fischer 1814). As *labiatus* (= *pecari*) was already type[§] of *Tayassu* Fischer 1814, the name *Dicotyles* lapses into synonymy. Reichenbach's *Pecari* 1835,[||] is therefore the earliest generic name available for the collared peccaries.

—*Gerrit S. Miller, Jr.*

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[*] These Proceedings, p. 215. October 31, 1914.

[†] Proc. Zool. Soc. London, 1868, p. 45.

[‡] See Opinion No. 6, Int. Comm. Zool. Nomenclature. July, 1910.

[§] By absolute tautonymy. As a synonym of his accurately diagnosed and described *Tayassu pecari*, "T. corpore nigro, maxillâ inferiore albâ," Fischer places the name "*Sus Tajassu* Linn. Gmel. syst. nat. 219. n. 3." (Zoognosia. vol. 3, p. 285).

[||] Bildergalerie der Thierwelt. Heft 6, p. 1. Type by monotypy *Sus torquatus* Cuvier. The entire case is correctly stated in my List of North American Land Mammals in the United States National Museum, 1911, pp. 383, 384. December 31, 1912, except that a reference to Gray, 1868, should take the place of the words "now selected," under *Dicotyles*, in line 9, p. 384.

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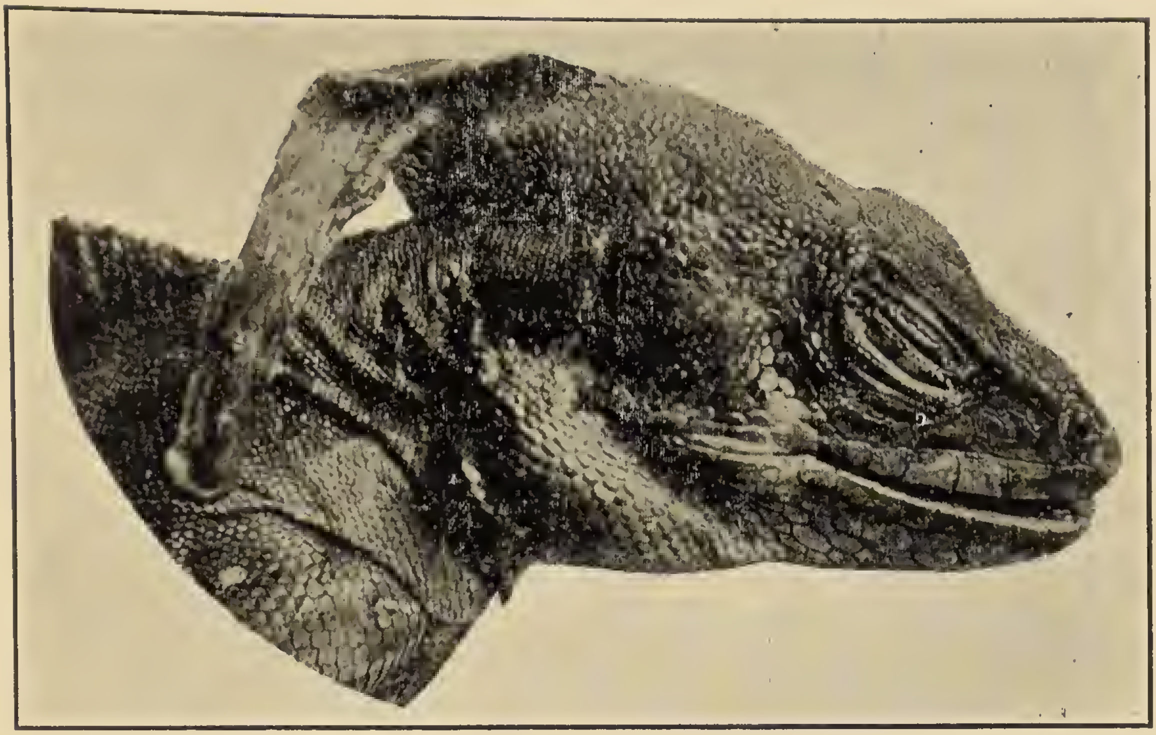


FIG. 1.—Lateral view (natural size) of head of type-specimen of *Basiliscus barbouri.*

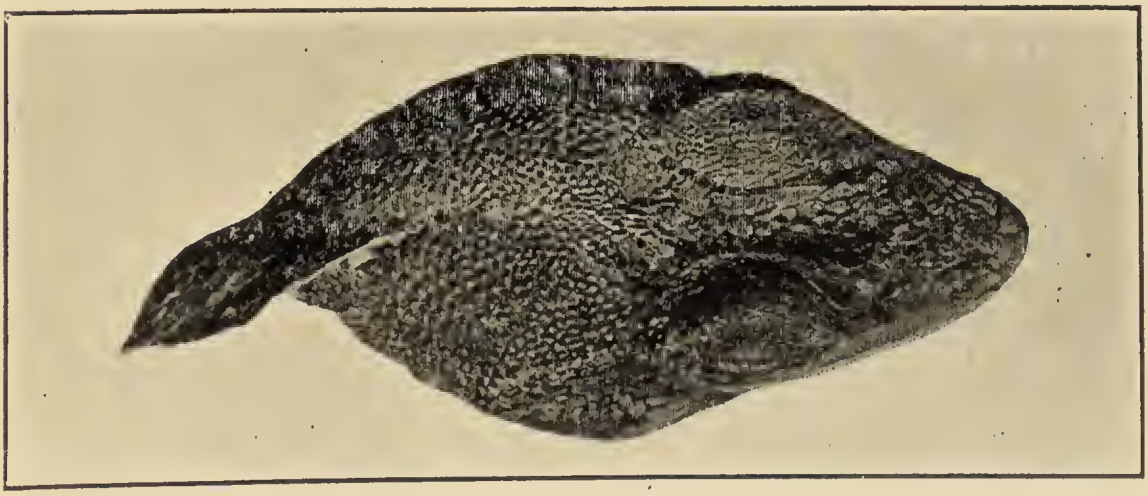
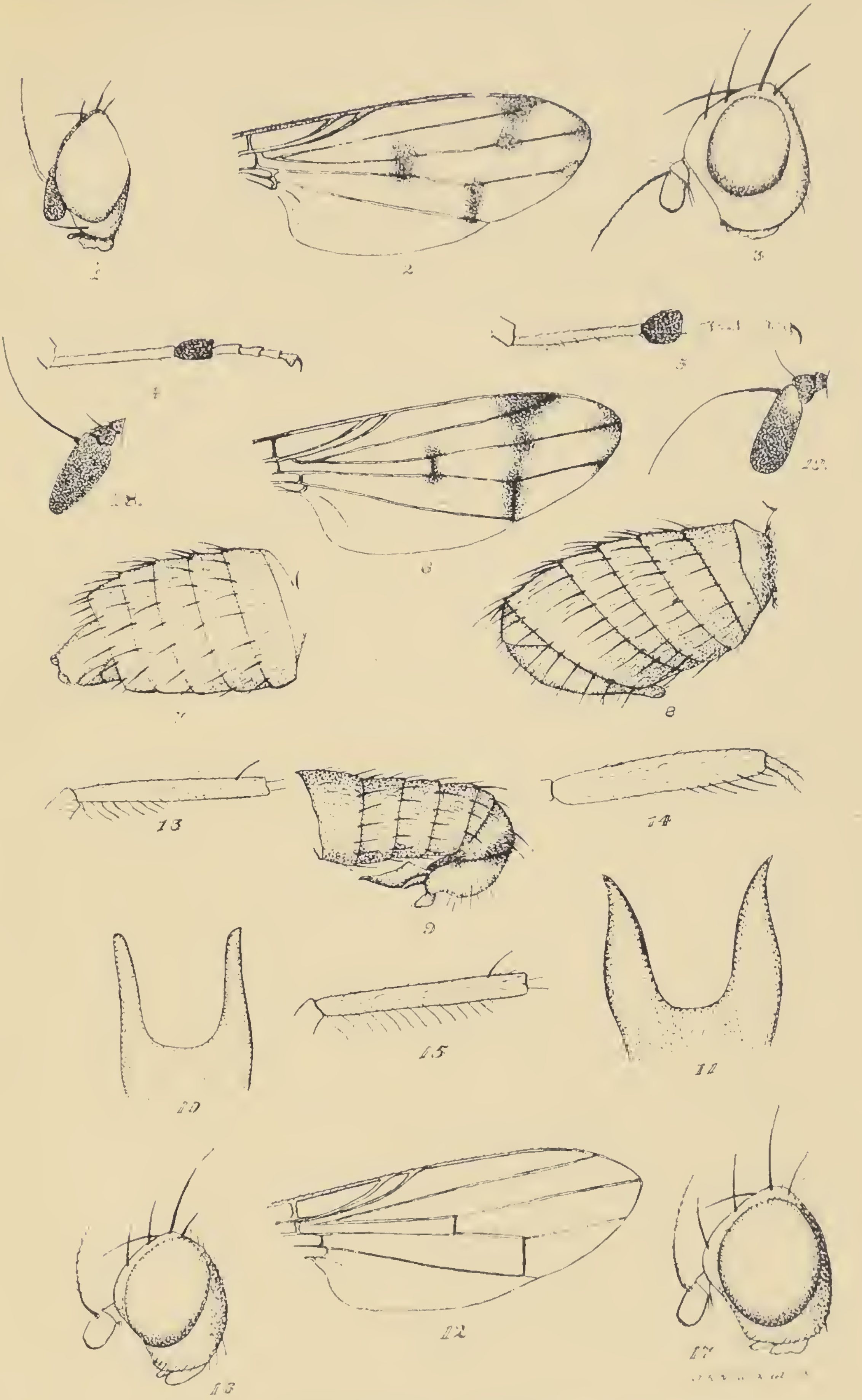
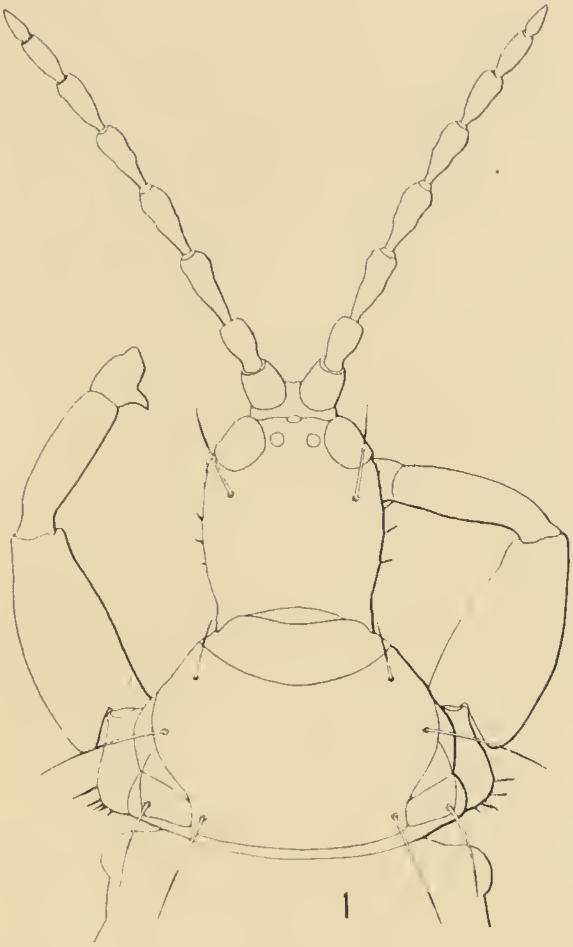


FIG. 2.—Dorsal view (natural size) of head of type-specimen of *Basiliscus barbouri.* (End of crest blocked out.)



EXPLANATION OF PLATE II.

Fig. 1. *Lonchaea vibrissata*, head of female.
Fig. 2. *Sapromyza similata*, wing.
Fig. 3. " *harti*, head.
Fig. 4. " *similata*, hind tarsus.
Fig. 5. " *compedita*, hind tarsus.
Fig. 6. " *compedita*, wing.
Fig. 7. " *harti*, abdomen of female.
Fig. 8. " *harti*, abdomen of male.
Fig. 9. " *seticauda*, abdomen of male.
Fig. 10. " *tenuispina*, last ventral segment of male abdomen.
Fig. 11. *Sapromyza bispina*, last ventral segment of male abdomen.
Fig. 12. " *seticauda*, wing.
Fig. 13. " *seticauda*, hind tibia of male.
Fig. 14. " *harti*, hind femur of male.
Fig. 15. " *cilifera*, hind tibia of male.
Fig. 16. " *inaequalis*, head of female.
Fig. 17. " *similata*, head of male.
Fig. 18. *Lonchaea winnemanae*, antenna of male.
Fig. 19. " *nudifemorata*, antenna of male.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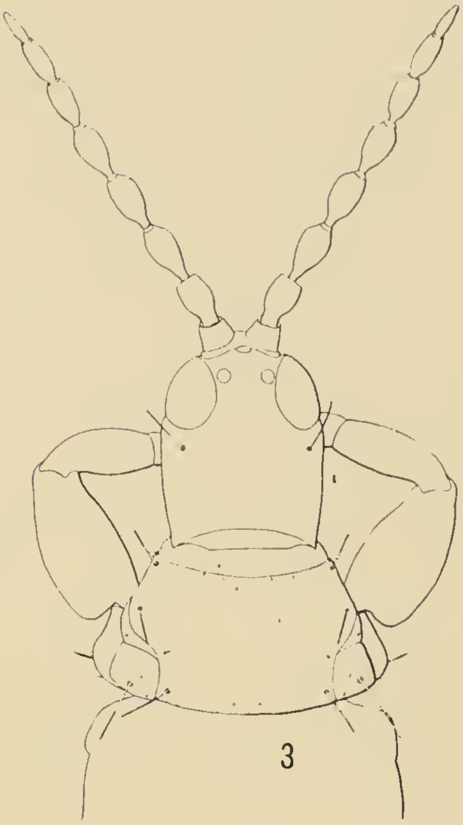
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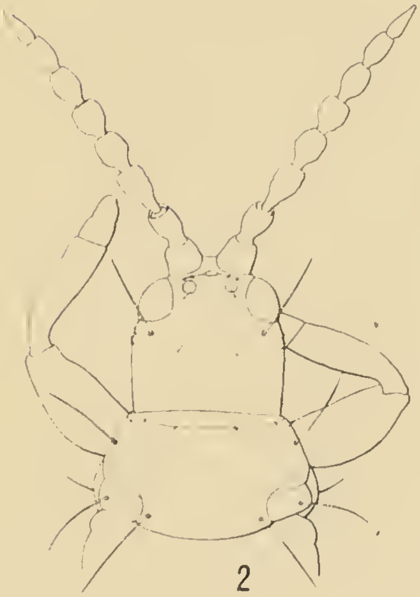
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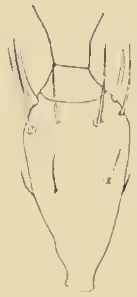
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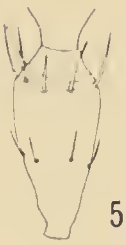
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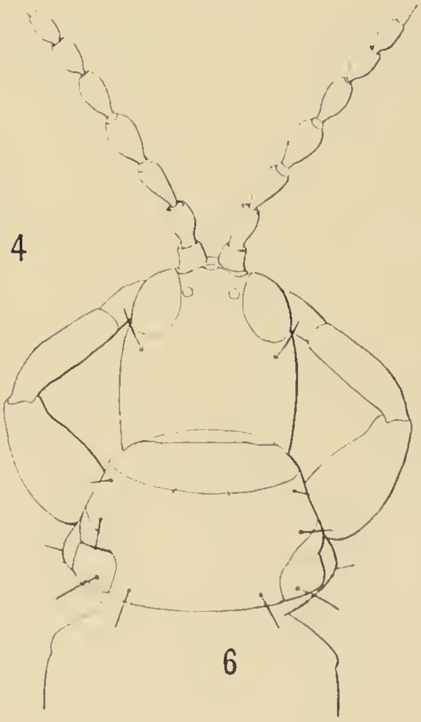
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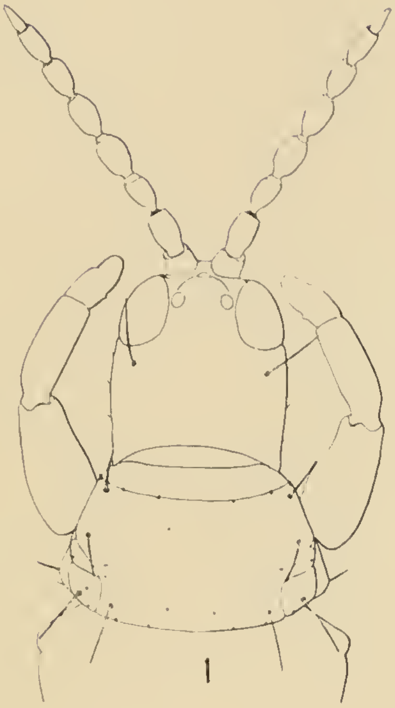

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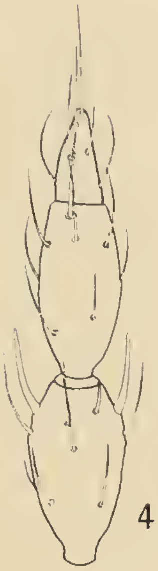

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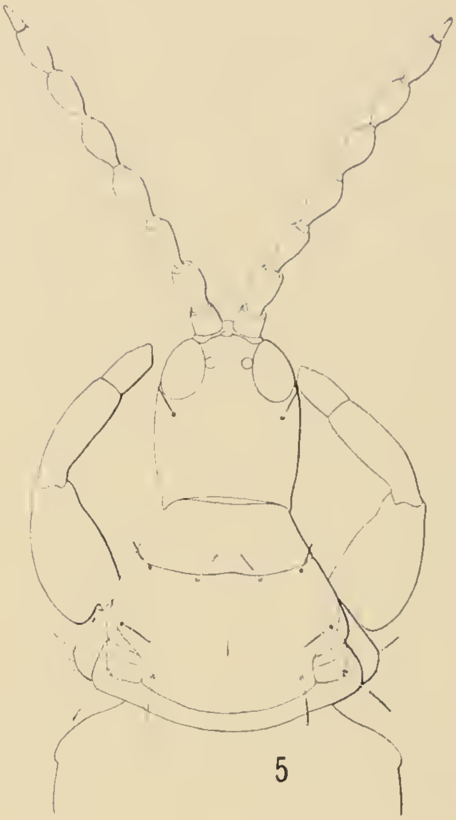

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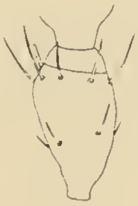

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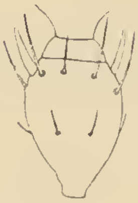

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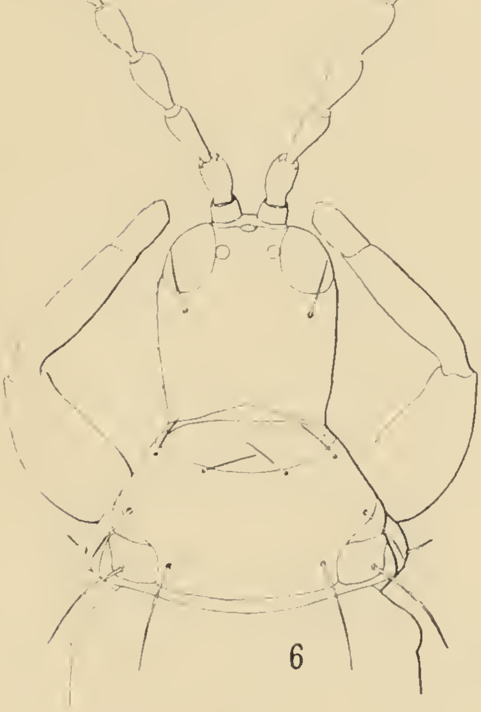

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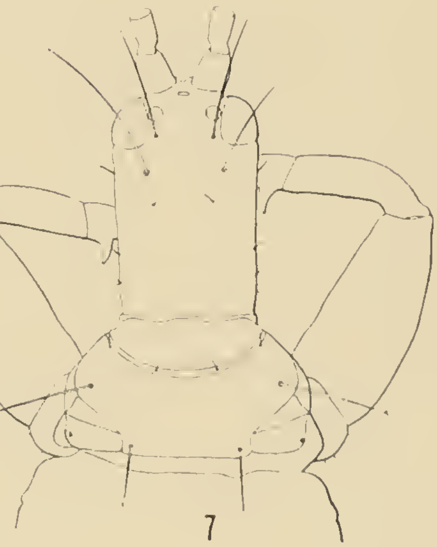

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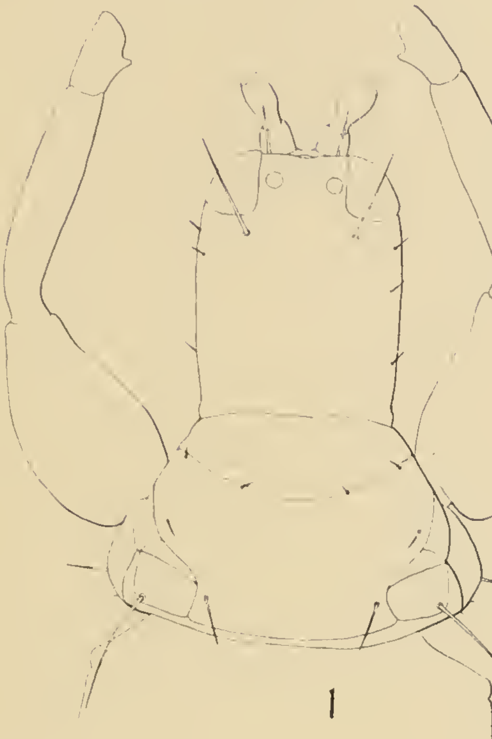
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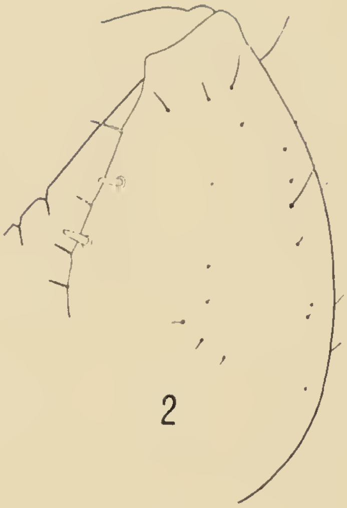
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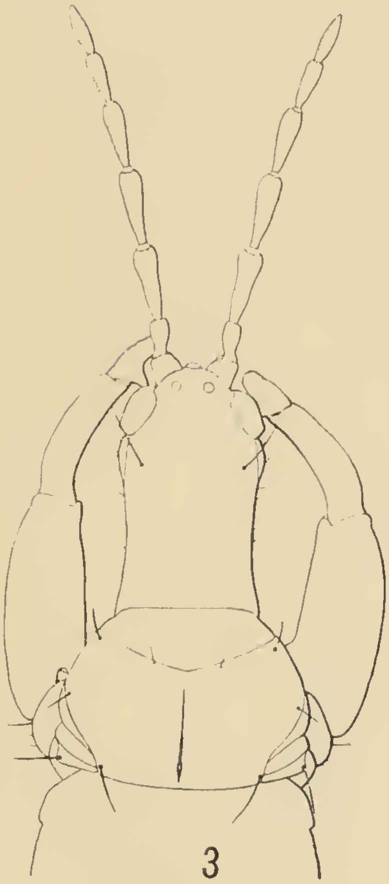
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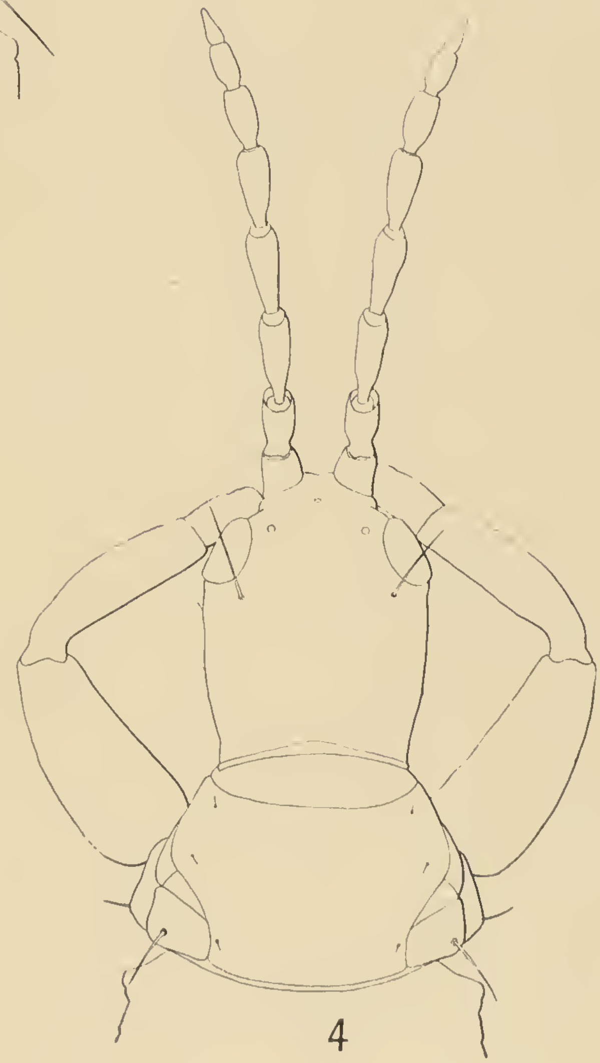
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